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END SEMESTER EXAMINATIONS, JULY-2018
PROGRAM : BCA **FIRST SEMESTER**

COURSE CODE : BCS113**COURSE TITLE : FUNDAMENTALS OF COMPUTER PROGRAMMING - I****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.**(2 x 10 = 20)**

- a. What is Computer?
- b. What is base of a number system? Write examples to illustrate the role of base in positional number systems.
- c. Define the term 'byte'. What is the difference between a bit and byte?
- d. Differentiate between PROM and EPROM.
- e. What is relationship between kilobytes, megabytes and gigabytes?
- f. What are the main limitations of primary storage of a computer system?
- g. Explain how an MICR device helps in faster processing of bank cheques with greater accuracy.
- h. How many types of software are there? Write three examples of each.
- i. What is a flowchart?
- j. What is an assembly language? What are its advantages over machine language?

SECTION B

Q. 2. Attempt any 5 questions.**(7 x 5 = 35)**

- a. What new types of computer application emerged during third, fourth and fifth computer generations and what were the main driving technologies behind each?
- b. Draw a block diagram to illustrate basic organization of a computer system and explain the functions of various units.
- c. Carry out the following conversions:
 - i. $(125)_6 = ?_4$
 - ii. $(24)_9 = ?_3$
 - iii. $(2B.D4)_{16} = ?_{10}$
 - iv. $(1001.0101)_2 = ?_{10}$
 - v. $(ABC)_{16} = ?_8$
 - vi. $(1694)_{10} = ?_2$
 - vii. $(1101011)_2 = ?_{10}$
- d. What is BCD and EBCDIC code? Why BCD code was extended to EBCDIC?
- e. Write a program to calculate area and circumference of a circle. Keep the value of $\pi = 3.14$ and value of radius is user define.
- f. What are the different types of networks? Describe each of the networks against following parameter:
 - i. Distance Coverage
 - ii. Speed of Operations
 - iii. Technologies used for medium
 - iv. Application
- g. What is the different between Logical and Bitwise Operators?

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.** a. Discuss about the various secondary storage devices in the computer system. (7.5)
b. What are the advantages and limitations of the magnetic disks? (7.5)
- Q. 4.** List the various input & output devices used in the computer system and also explain each of them. (15)
- Q. 5.** a. What is network topology? Describe four network topologies in common use. Write their relative advantages and disadvantages. (7.5)
b. What is Relational Operators? Explain with the help of example. Show the operator precedence order of the Bitwise Operator. (7.5)
- Q. 6.** a. What are the different Electronic Payment System. Explain each system. (7.5)
b. Discuss the following terminology : (7.5)
 i. Electronic Mail
 ii. FTP
 iii. Telnet
- Q. 7.** A shopkeeper wants a general program for his personal computer to prepare a bill for each customer. His idea is that as soon as a customer purchases some goods from his shop, he will supply the description, unit price, and quantity purchased for each item as input to the computer, and the computer should print each item along with its unit price. Finally, the computer should also print the total cost of all item purchased by the customer. Assuming a sentinel value of zero for the quantity purchased filed in the trailer record, draw a flowchart for an algorithm to process this requirement. (15)

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END SEMESTER EXAMINATIONS, JULY-2018**PROGRAM : BCA****FIRST SEMESTER****COURSE CODE : BCA105****COURSE TITLE : FOUNDATION COURSE IN MATHEMATICS - I****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all parts of this question.**(2×10 = 20)**

- a. Find the 2nd derivative of $y = \sin(ax + b)$.
- b. Calculate $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$.
- c. State Lagrange's mean-value Theorem.
- d. Write the condition that two vectors A and B are perpendicular.
- e. Write the condition that a non-homogenous system of linear equations to have a unique solutions?
- f. Find the value of $\begin{vmatrix} 9 & 9 & 12 \\ 1 & 3 & -4 \\ 1 & 9 & 12 \end{vmatrix}$, using the properties of determinants.
- g. If $A = i + j + k$ and $B = i + 2j - k$ find $A \times B$.
- h. If $A = i + 5j + 2k$ and $B = -i + 6j - k$ find the dot product of A and B .
- i. Solve the integral $\int x \cos x^2 dx$.
- j. Find the cofactor of the element a_{12} in the following determinant $\begin{vmatrix} 2 & 0 & -2 \\ 0 & -5 & 3 \\ 3 & 1 & 3 \end{vmatrix}$.

SECTION B**Q. 2.** Attempt any 5 parts of this questions.**(7×5 = 35)**

- a. Solve $\lim_{x \rightarrow 0} \frac{10 - 10 \cos x}{x^3}$.
- b. Find $|\vec{a}|$ and $|\vec{b}|$, if $(\vec{a} - \vec{b}) \cdot (\vec{a} + \vec{b}) = 27$ and $|\vec{a}| = 2|\vec{b}|$.
- c. Verify Rolle's theorem for the following function in the interval $[0, 4]$
$$f(x) = (x-1)(x-2)(x-3).$$
- d. Find the value of the integral $\int \frac{(1+x)e^x}{\cos^2(xe^x)} dx$
- e. Find the maxima and minima of the function $f(x) = (x-1)(x-2)(x-3)$.
- f. Find the value of λ , which makes the vectors $3i - 2j + 4k$, $6i + \lambda j + k$ and $2i + 2j + 6k$ coplanar.

- g. Find the rank of the matrix $\begin{bmatrix} 3 & 1 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 5 \end{bmatrix}$.

SECTION C

Attempt any 3 questions.

(15×3 = 45)

- Q. 3. a. Solve the following system of equations by Cramer rule

$$\begin{aligned} x - 4y - 11z &= 11, \\ 2x - 5y + 2z &= 39, \\ -3x + 2y + z &= 7. \end{aligned}$$

(8)

- b. For what value of c , the mean value theorem is verified by the function

$$f(x) = 3x^2 + 4x - 3; [1, 3].$$

(7)

- Q. 4. a. Trace the curve $y^2(a+x) = x^2(3a-x)$.

(8)

- b. Find the inverse of the matrix A by elementary row operation: $A = \begin{bmatrix} 2 & -1 & 3 \\ 1 & 1 & 1 \\ 1 & -1 & 1 \end{bmatrix}$

(7)

- Q. 5. a. If $y = \sin(m \sin^{-1} x)$ then prove that

$$(1-x^2)y_{n+2} - (2n+1)xy_{n+1} + (m^2-n^2)y_n = 0.$$

(8)

- b. Solve $\int \frac{e^{m \tan^{-1} x}}{1+x^2} dx$.

(7)

- Q. 6. a. Test the continuity as well as differentiability of the function $f(x) = \begin{cases} x-1, & x > 1 \\ 0, & x = 1 \\ 1-x, & x < 1 \end{cases}$ at $x = 1$.

(8)

- b. Find the n^{th} derivative of $y = \frac{1}{x^2 - a^2}$.

(7)

- Q. 7. a. Prove that $\begin{vmatrix} a^2 & a & bc \\ b^2 & b & ca \\ c^2 & c & ab \end{vmatrix} = - \begin{vmatrix} 1 & 1 & 1 \\ a^2 & b^2 & c^2 \\ a^3 & b^3 & c^3 \end{vmatrix}$

(8)

- b. If $\vec{A} = 3\hat{i} - \hat{j} - 2\hat{k}$ and $\vec{B} = 2\hat{i} + 3\hat{j} - 5\hat{k}$ find $(\vec{A} + 2\vec{B}) \times (2\vec{A} - \vec{B})$.

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END SEMESTER EXAMINATIONS, JULY-2018

PROGRAM : BCA

FIRST SEMESTER

COURSE CODE : BCA103

COURSE TITLE : ENGLISH LANGUAGE & COMMUNICATION SKILLS

[Time allotted: Two hours]

[Max. Marks: 50]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(1 x 10 = 10)

a. Fill in the blanks with a suitable word:

(i) The type of communication which informally takes place in an organization in form of gossips and rumours is called _____

(ii) A barrier to communication which occurs due to lack of knowledge of language, is called _____.

b. Chose the correct verb from bracket:

(i) The players, as well as the captain _____ to win. (wants, want)

(ii) My classmates _____ before the exam date. (studies, study)

c. Write a synonym for the following:

(i) zeal (ii) loyal (iii) concise (iv) value

d. Write antonym for following:

(i) damage (ii) brutal (iii) transparent (iv) disgrace

e. Correct the following sentences:

(i) I spending the holidays with my family members.

(ii) He found a ten-rupees note in the field.

f. Fill in the blanks with suitable prepositions:

(i) We will talk to the teacher _____ that matter. (ii) My friend put the matter _____ the committee.

g. Make the sentences to show the difference in meaning of:

(i) substitute / replace (ii) speak / say

h. Insert articles where required:

(i) Always speak truth. (ii) Cricket is game of chance.

i. Give any two undesirable reading habits.

j. Give the Part of Speech of the underlined words :

His work is the best.SECTION B

Q. 2. Attempt any 4 questions.

(4 x 5 = 20)

a. How can one develop listening skills? Discuss. (5)

b. "Communication is a dynamic two way process which involves effective transmission of ideas" Explain the statement. (5)

c. (a) Differentiate active listening with passive listening with examples. (3)

(b) Use following words into sentences: (2)

(i) creation (ii) decline (iii) responsibility (iv) traditional

d. Differentiate between skimming and scanning reading and discuss their importance and usage in the academic world. (5)

e. Give the meaning of the following pairs of homophones and use them in sentences: (5)

(i) alter / altar (ii) stationary / stationery (iii) bail / bale (iv) rain / reign (v) coast / cost

f. Use the following idioms in sentences of your own: (5)

(i) live from hand to mouth

(iii) at the eleventh hour

(v) once in a blue moon

(ii) bag and baggage

(iv) ups & downs

SECTION C

Attempt any 2 questions.

(10 x 2 = 20)

Q. 3. Write an application to the Dean of your college requesting him to arrange an industrial tour for your class. Invent necessary details.

Q. 4. Write an essay on any one of the following topics(300-350 words) :-

- (i) Importance of language lab (ii) E- Learning (iii) Moral values

Q.5. Read the given passage and answer the questions :

When you're sick, it isn't always easy to get well again. There are lots of medicines and other ways to treat health problems. You may hear about some from a friend or you may see an ad on TV or in the newspaper. Your doctor may also recommend a treatment. It is the Food and Drug Administration's (FDA) job to make sure the medicines and other treatments people buy are safe and really work. Most treatments you can buy have the FDA's approval; however, some do not. Sometimes there are no FDA approved treatments that may help you. This is mainly true for illnesses like some cancers and AIDS. This is also true for chronic illnesses like arthritis.

There are many unproven treatments that may or may not work. A couple you may have heard of are:

- **Imagery** – You learn to imagine yourself in a certain way. For example, you might be guided to think of yourself as very strong or healthy and think of your sickness as weak and easy to destroy.
- **Biofeedback** – You try to make yourself better by learning to control body functions like your heart rate, temperature, and muscles.

If you want to try an unproven treatment, talk to people who have tried it. Ask them about everything that happened during and after the treatment – both good and bad. Ask the person who is giving the treatment what kind of training they've had and how long they have been doing the treatment. Also, find out how much it will cost. Health insurance may not pay for unproven treatments. Before you try an unproven treatment, talk to someone who knows about it and tell your doctor that you're thinking about trying it. Watch out for phony treatments. People who sell phony health products often use tricks to gain your trust and get your money. Question ads that talk about: secret formulas; amazing breakthroughs or miracle cures; and, quick, painless, or guaranteed cures. Phony medicines or treatments cheat you out of money and some can make you even sicker. Consult your doctor or pharmacist about treatments that may help you.

- a. What is the job of the FDA ? (2)
- b. Explain 'Imagery' and 'Biofeedback'. (2)
- c. How should one try an unproven treatment? (2)
- d. Skim the text and write a summary in approx. 60 words. (4)

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END SEMESTER EXAMINATIONS, JULY-2018**PROGRAM : BCA****FIRST SEMESTER****COURSE CODE : BCA106****COURSE TITLE : PRINCIPLES & PRACTICES OF MANAGEMENT****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. This approach is one of the oldest approaches in the management.
- b.is the situation in an organization where all the power is given to top-most person only.
- c. Management is a combination of two subjects they are.....
- d. Planning is a bridge between where we are &
- e.management is the branch of management which takes care of all the finances.
- f. The topmost need in Maslow's Need hierarchy is.....
- g. is an art for getting things done through others.
- h. The responsibility of the business to the society is known as.....
- i. What is the full form of M.B.O.?
- j. Who suggested and propounded the 14 principles of management?

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. What do you mean by ethics in business?
- b. What are the functions of management? Explain any three of them.
- c. What do you mean by Maslow's need hierarchy?
- d. Explain the contemporary challenges of the managements.
- e. What do you mean by management by objective?
- f. What do you mean by "mobilizing best talent", why it is useful in management?
- g. Subordination of personal interest over organization interest, Explain.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.** Explain the Mintzberg's management roles in detail.
- Q. 4.** What do you mean by decision making? Explain the process of decision making.
- Q. 5.** What do you mean by planning? Explain the types of planning.
- Q. 6.** Explain all principles of management by Henri Fayol.
- Q. 7.** 'Management is an Art & Science of Decision making'. Explain.

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END SEMESTER EXAMINATIONS, JULY-2018**PROGRAM : BCA****FIRST SEMESTER****COURSE CODE : BCA104****COURSE TITLE : ENVIRONMENTAL STUDIES****[Time allotted: Two hours]****[Max. Marks: 50]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt **all** questions.**(1 x 10 = 10)**

- a. Full form of PAN is
- b. Name two components of smoke.
- c. Define term food chain.
- d. Mesosphere is the
- e. Full form of term POP's is
- f. The term ecosystem was coined by
- g. There are.....types of food chain.
- h. Air (pollution control) act was enacted in year
- i. Mercury is an example of
- j. Full form of LCA is

SECTION B**Q. 2.** Attempt **any 4** questions.**(4 x 5 = 20)**

- a. Discuss the consequences of burning of fossil fuels on environment.
- b. Discuss the methodology and significance of environmental impact assessment.
- c. Discuss the silent features of Environmental Protection Act, 1986.
- d. What are primary and secondary energy resources? Explain with examples.
- e. Discuss about the different components of ecosystem.
- f. What do you mean by term environmental pollution? What are its different types?

SECTION CAttempt **any 2** questions.**(10 x 2 = 20)**

- Q. 3.**
 - a. Define the term environmental toxicology. Describe the toxic effects of mercury on humans.
 - b. Discuss the harmful impact of different components present in smoke.
- Q. 4.**
 - a. What do you mean by sustainable development? Discuss its main objectives.
 - b. What are biogeochemical cycles? Explain with the help of diagram.
- Q. 5.**
 - a. Discuss the importance of forest resources in detail.
 - b. What are different methods of water conservation? Explain with examples.

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END SEMESTER EXAMINATIONS, JULY-2018

PROGRAM : BCA

FIRST SEMESTER

COURSE CODE : BCA103

COURSE TITLE : ENGLISH LANGUAGE & COMMUNICATION SKILLS

[Time allotted: Two hours]

Note: Attempt all Sections & Questions.

[Max. Marks: 50]

SECTION A

Q. 1. Attempt all questions.

(1 x 10 = 10)

a. Fill in the blanks with a suitable word:

(i) The type of communication which informally takes place in an organization in form of gossips and rumours is called _____

(ii) A barrier to communication which occurs due to lack of knowledge of language, is called _____.

b. Chose the correct verb from bracket:

(i) The players, as well as the captain _____ to win. (wants, want)

(ii) My classmates _____ before the exam date. (studies, study)

c. Write a synonym for the following:

(i) zeal (ii) loyal (iii) concise (iv) value

d. Write antonym for following:

(i) damage (ii) brutal (iii) transparent (iv) disgrace

e. Correct the following sentences:

(i) I spending the holidays with my family members.

(ii) He found a ten-rupees note in the field.

f. Fill in the blanks with suitable prepositions:

(i) We will talk to the teacher _____ that matter. (ii) My friend put the matter _____ the committee.

g. Make the sentences to show the difference in meaning of:

(i) substitute / replace (ii) speak / say

h. Insert articles where required:

(i) Always speak truth. (ii) Cricket is game of chance.

i. Give any two undesirable reading habits.

j. Give the Part of Speech of the underlined words :

His work is the best.

SECTION B

Q. 2. Attempt any 4 questions.

(4 x 5 = 20)

a. How can one develop listening skills? Discuss.

(5)

b. "Communication is a dynamic two way process which involves effective transmission of ideas" Explain the statement.

(5)

c. (a) Differentiate active listening with passive listening with examples.

(5)

(b) Use following words into sentences:

(3)

(i) creation (ii) decline (iii) responsibility (iv) traditional

(2)

d. Differentiate between skimming and scanning reading and discuss their importance and usage in the academic world.

(5)

e. Give the meaning of the following pairs of homophones and use them in sentences:

(5)

(i) alter / altar (ii) stationary / stationery (iii) bail / bale (iv) rain / reign (v) coast / cost

f. Use the following idioms in sentences of your own:

(5)

(i) live from hand to mouth

(iii) at the eleventh hour

(v) once in a blue moon

(ii) bag and baggage

(iv) ups & downs

SECTION C

(10 x 2)

Attempt any 2 questions.

Q. 3. Write an application to the Dean of your college requesting him to arrange an industrial tour for your class. Invent necessary details.

Q. 4. Write an essay on any one of the following topics (300-350 words) :-

- (i) Importance of language lab (ii) E- Learning (iii) Moral values

Q.5. Read the given passage and answer the questions :

When you're sick, it isn't always easy to get well again. There are lots of medicines and other ways to solve health problems. You may hear about some from a friend or you may see an ad on TV or in the newspaper. Your doctor may also recommend a treatment. It is the Food and Drug Administration's (FDA) job to make sure the medicines and other treatments people buy are safe and really work. Most treatments you can buy have FDA's approval; however, some do not. Sometimes there are no FDA approved treatments that may help you. This is mainly true for illnesses like some cancers and AIDS. This is also true for chronic illnesses like arthritis.

There are many unproven treatments that may or may not work. A couple you may have heard of are:

- **Imagery** – You learn to imagine yourself in a certain way. For example, you might be guided to think of yourself as very strong or healthy and think of your sickness as weak and easy to destroy.
- **Biofeedback** – You try to make yourself better by learning to control body functions like your heart rate, temperature, and muscles.

If you want to try an unproven treatment, talk to people who have tried it. Ask them about everything that happened during and after the treatment – both good and bad. Ask the person who is giving the treatment about the kind of training they've had and how long they have been doing the treatment. Also, find out how much it costs. Health insurance may not pay for unproven treatments. Before you try an unproven treatment, talk to someone who knows about it and tell your doctor that you're thinking about trying it. Watch out for phony treatments. People who sell phony health products often use tricks to gain your trust and get your money. Question ads that talk about: secret formulas; amazing breakthroughs or miracle cures; and, quick, painless, guaranteed cures. Phony medicines or treatments cheat you out of money and some can make you even sicker. Consult your doctor or pharmacist about treatments that may help you.

- a. What is the job of the FDA?
- b. Explain 'Imagery' and 'Biofeedback'.
- c. How should one try an unproven treatment?
- d. Skim the text and write a summary in approx. 60 words.

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END SEMESTER EXAMINATIONS, JULY-2018

PROGRAM : BCA

FIRST SEMESTER

COURSE CODE : BCA104

COURSE TITLE : ENVIRONMENTAL STUDIES

[Time allotted: Two hours]

[Max. Marks: 50]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt **all** questions.

(1 x 10 = 10)

- a. Full form of PAN is
- b. Name two components of smoke.
- c. Define term food chain.
- d. Mesosphere is the
- e. Full form of term POP's is
- f. The term ecosystem was coined by
- g. There are.....types of food chain.
- h. Air (pollution control) act was enacted in year
- i. Mercury is an example of
- j. Full form of LCA is

SECTION B

Q. 2. Attempt **any 4** questions.

(4 x 5 = 20)

- a. Discuss the consequences of burning of fossil fuels on environment.
- b. Discuss the methodology and significance of environmental impact assessment.
- c. Discuss the silent features of Environmental Protection Act, 1986.
- d. What are primary and secondary energy resources? Explain with examples.
- e. Discuss about the different components of ecosystem.
- f. What do you mean by term environmental pollution? What are its different types?

SECTION C

Attempt **any 2** questions.

(10 x 2 = 20)

- Q. 3.**
 - a. Define the term environmental toxicology. Describe the toxic effects of mercury on humans.
 - b. Discuss the harmful impact of different components present in smoke.
- Q. 4.**
 - a. What do you mean by sustainable development? Discuss its main objectives.
 - b. What are biogeochemical cycles? Explain with the help of diagram.
- Q. 5.**
 - a. Discuss the importance of forest resources in detail.
 - b. What are different methods of water conservation? Explain with examples.

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END SEMESTER EXAMINATIONS, JULY-2018

PROGRAM : BCA

FIRST SEMESTER

COURSE CODE : BCA106

COURSE TITLE : PRINCIPLES & PRACTICES OF MANAGEMENT

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt **all** questions.

(2 x 10 = 20)

- a. This approach is one of the oldest approaches in the management.
- b.is the situation in an organization where all the power is given to top-most person only.
- c. Management is a combination of two subjects they are.....
- d. Planning is a bridge between where we are &
- e.management is the branch of management which takes care of all the finances.
- f. The topmost need in Maslow's Need hierarchy is.....
- g. is an art for getting things done through others.
- h. The responsibility of the business to the society is known as.....
- i. What is the full form of M.B.O.?
- j. Who suggested and propounded the 14 principles of management?

SECTION B

Q. 2. Attempt **any 5** questions.

(7 x 5 = 35)

- a. What do you mean by ethics in business?
- b. What are the functions of management? Explain any three of them.
- c. What do you mean by Maslow's need hierarchy?
- d. Explain the contemporary challenges of the managements.
- e. What do you mean by management by objective?
- f. What do you mean by "mobilizing best talent", why it is useful in management?
- g. Subordination of personal interest over organization interest, Explain.

SECTION C

Attempt **any 3** questions.

(15 x 3 = 45)

- Q. 3.** Explain the Mintzberg's management roles in detail.
- Q. 4.** What do you mean by decision making? Explain the process of decision making.
- Q. 5.** What do you mean by planning? Explain the types of planning.
- Q. 6.** Explain all principles of management by Henri Foyal.
- Q. 7.** 'Management is an Art & Science of Decision making'. Explain.

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END SEMESTER EXAMINATIONS, JULY-2018

PROGRAM : BCA

FIRST SEMESTER

COURSE CODE : BCA105

COURSE TITLE : FOUNDATION COURSE IN MATHEMATICS - I

[Time allotted: Three hours]

Note: Attempt all Sections & Questions.

[Max. Marks: 100]

SECTION A

Q. 1. Attempt all parts of this question.

(2×10 = 20)

- a. Find the 2nd derivative of $y = \sin(ax + b)$.
- b. Calculate $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$.
- c. State Lagrange's mean-value Theorem.
- d. Write the condition that two vectors A and B are perpendicular.
- e. Write the condition that a non-homogenous system of linear equations to have a unique solutions?
- f. Find the value of $\begin{vmatrix} 9 & 9 & 12 \\ 1 & 3 & -4 \\ 1 & 9 & 12 \end{vmatrix}$, using the properties of determinants.
- g. If $A = i + j + k$ and $B = i + 2j - k$ find $A \times B$.
- h. If $A = i + 5j + 2k$ and $B = -i + 6j - k$ find the dot product of A and B .
- i. Solve the integral $\int x \cos x^2 dx$.
- j. Find the cofactor of the element a_{12} in the following determinant $\begin{vmatrix} 2 & 0 & -2 \\ 0 & -5 & 3 \\ 3 & 1 & 3 \end{vmatrix}$.

SECTION B

Q. 2. Attempt any 5 parts of this questions.

(7×5 = 35)

- a. Solve $\lim_{x \rightarrow 0} \frac{10 - 10 \cos x}{x^3}$.
- b. Find $|\vec{a}|$ and $|\vec{b}|$, if $(\vec{a} - \vec{b}) \cdot (\vec{a} + \vec{b}) = 27$ and $|\vec{a}| = 2|\vec{b}|$.
- c. Verify Rolle's theorem for the following function in the interval $[0, 4]$
$$f(x) = (x-1)(x-2)(x-3).$$
- d. Find the value of the integral $\int \frac{(1+x)e^x}{\cos^2(xe^x)} dx$
- e. Find the maxima and minima of the function $f(x) = (x-1)(x-2)(x-3)$.
- f. Find the value of λ , which makes the vectors $3i - 2j + 4k$, $6i + \lambda j + k$ and $2i + 2j + 6k$ coplanar.

- g. Find the rank of the matrix $\begin{bmatrix} 3 & 1 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 5 \end{bmatrix}$.

SECTION C

Attempt **any 3** questions.

(15×3 = 45)

- Q. 3. a. Solve the following system of equations by Cramer rule

$$x - 4y - 11z = 11,$$

$$2x - 5y + 2z = 39,$$

$$-3x + 2y + z = 7.$$

(8)

- b. For what value of c , the mean value theorem is verified by the function $f(x) = 3x^2 + 4x - 3; [1, 3]$.

(7)

- Q. 4. a. Trace the curve $y^2(a+x) = x^2(3a-x)$.

(8)

- b. Find the inverse of the matrix A by elementary row operation: $A = \begin{bmatrix} 2 & -1 & 3 \\ 1 & 1 & 1 \\ 1 & -1 & 1 \end{bmatrix}$

(7)

- Q. 5. a. If $y = \sin(m \sin^{-1} x)$ then prove that

$$(1-x^2)y_{n+2} - (2n+1)xy_{n+1} + (m^2 - n^2)y_n = 0.$$

(8)

- b. Solve $\int \frac{e^{m \tan^{-1} x}}{1+x^2} dx$.

(7)

- Q. 6. a. Test the continuity as well as differentiability of the function $f(x) = \begin{cases} x-1, & x > 1 \\ 0, & x = 1 \\ 1-x, & x < 1 \end{cases}$ at $x = 1$.

(8)

- b. Find the n^{th} derivative of $y = \frac{1}{x^2 - a^2}$.

(7)

- Q. 7. a. Prove that $\begin{vmatrix} a^2 & a & bc \\ b^2 & b & ca \\ c^2 & c & ab \end{vmatrix} = - \begin{vmatrix} 1 & 1 & 1 \\ a^2 & b^2 & c^2 \\ a^3 & b^3 & c^3 \end{vmatrix}$

(8)

- b. If $\vec{A} = 3\hat{i} - \hat{j} - 2\hat{k}$ and $\vec{B} = 2\hat{i} + 3\hat{j} - 5\hat{k}$ find $(\vec{A} + 2\vec{B}) \times (2\vec{A} - \vec{B})$.

(7)

Enrol. No. S R H U

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END SEMESTER EXAMINATIONS, JUNE - 2018
PROGRAM : BCA **SECOND SEMESTER**

COURSE CODE : BCA113**COURSE TITLE : FUNDAMENTALS OF ACCOUNTING AND FINANCE****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt **all** questions. Write short notes on the following:**(2 x 10 = 20)**

- | | |
|----------------------|---------------------------|
| a. Balance Sheet | f. Raw Material |
| b. Owner's Equity | g. Inventory |
| c. Income Statement | h. Sundry Creditors |
| d. Accounting Period | i. Break Even Point |
| e. Finished Goods | j. Dematerialized Account |

SECTION B

Q. 2. Attempt **any 5** questions.**(7 x 5 = 35)**

- Explain in detail money measurement and accrual concept of Accounting.
- What you understand by the convention of disclosure in Accounting?
- Define Break Even Point. Is it acceptable for a new business?
- Differentiate between Capital Market and Money Market.
- How the functions of accountant differ for external user and internal user?
- Calculate Quick Ratio where Stock = Rs. 80,000; Working Capital = Rs. 2,40,000; and Current Assets = Rs. 4,00,000. Write names of any two money market instruments.
- Describe various sections of Balance Sheet.

SECTION C

Attempt **any 3** questions.**(15 x 3 = 45)****Q. 3.** Explain three accounting conventions in detail.**(5*3)****Q. 4.** Write the process of Accounting.**(15)****Q. 5.** Write the process of Common Size Statement Analysis.**(15)**

Q. 6. Ironically, Satyam means "truth" in the ancient Indian language "Sanskrit". Satyam won the "Golden Peacock Award" for the best governed company in 2007 and in 2009. From being India's IT "crown jewel" and the country's "fourth largest" company with high-profile customers, the outsourcing firm Satyam Computers has become embroiled in the nation's biggest corporate scam in living memory. Mr. Ramalinga Raju (Chairman and Founder of Satyam; henceforth called "Raju"), who has been arrested and has confessed to a \$1.47 billion (or Rs. 7800 crore) fraud, admitted that he had made up profits for years. According to reports, Raju and his brother, B. Rama Raju, who was the Managing Director, "hid the deception from the company's board, senior managers, and auditors". The case of Satyam's accounting fraud has been dubbed as "India's Enron".

- Why is Satyam labelled as "India's Enron"? **(7.5)**
- What were the factors that contributed to the "unethical" decisions made by the company's executives? **(7.5)**

Q. 7. What is financial management? What is significance of financial management to modern organizations?**(15)**

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END SEMESTER EXAMINATION, JUNE-2018
PROGRAM : BCA SECOND SEMESTER

COURSE CODE : BCA108**COURSE TITLE : ADVANCE CONCEPTS OF 'C' PROGRAMMING****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt **all** questions.**(2 x 10 = 20)**

- a. What is pointer? Write down a program to swap two integers with the help of call by reference.
- b. What is dangling pointer?
- c. What is an array?
- d. What are the roles of the C preprocessor? How C preprocessor is different from C Compiler?
- e. What are command line arguments?

Find the output of the following programs. Assume stdio.h is included in all programs

- f.

```
int main()
{
    int a[5]={1},b[5]={1};
    if (a=b)
        printf("Same\n");
    else
        printf("Different\n");
    return 0;
}
```
- g.

```
int main()
{
    int arr[8]={ 10,11,12,13,20,21,22,23};
    int *p,*q;
    q=arr/2;
    p=q*2;
    printf("%d %d",*p,*q);
    return 0;
}
```
- h.

```
int main()
{
    int i, arr[5]={ 25,30,35,40,45},*p;
    p=arr;
    for (i=0;i<5;i++)
        printf("%d\t%d\t",*(p+i),p[i]);
    return 0;
}
```
- i.

```
int main(void)
{
    int a=9;
    if(a=5)
        printf("a if five\t");
    else
        printf("a is not five\t");
    printf("value of a is %d \n",a);
    return 0;
}
```

```

j. int main(void)
{
    int i=10;
    if(i==50)
        printf("a if fifty\\t");
    else
        printf("a is not fifty\\t");
    return 0;
}

```

SECTION B

Q. 2. Attempt **any 5** questions.

(7 x 5 = 35)

- a. What are the different storage classes in C? Explain in term of storage, default initial value, scope and life.
- b. What is Bit-Fields? How it is useful for C programming? Demonstrate with the help of program.
- c. What is the role of Files in C? Differentiate between text and binary streams. Also explain the usefulness of buffer.
- d. What is Bit Mask? Write down the program that converts decimal numbers (0 to 15) into binary using bit mask.
- e. Define the header file. How to create the user define header file for sum of two value. Write down the program for that.
- f. Write a function that inputs a binary number and convert to decimals.
- g. What is recursive function? Write down the program that generates the Fibonacci series.

SECTION C

Attempt **any 3** questions.

(15 x 3 = 45)

- Q. 3.** Give the brief introduction about Input-output system calls in C. Write the program used for Open the file for reading, writing or both. (15)
- Q. 4.**
 - a. Differentiate between recursion and iteration. What is tail recursion? Explain with the help of program. (7. 5)
 - b. What is memory architecture of two dimensional arrays? Write down the program for addition of two matrices. (7.5)
- Q. 5.**
 - a. Define C preprocessor. Write down the program to understand the use of #if directive. (7.5)
 - b. Write down the program to use of #else directive. (7.5)
- Q. 6.**
 - a. What are the different functions used for file I/O. Explain the role of each function in brief. (7.5)
 - b. What are the Bitwise Operators? Write down the program to find out the whether a number is even or odd. (7.5)
- Q. 7.**
 - a. What is pixel? Write down the program to draw the line and circle in graph mode. (7.5)
 - b. Differentiate between structure and union. Also write down the program that contains structure as well as union. (7.5)

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END SEMESTER EXAMINATION, JUNE - 2018
PROGRAM: BCA SECOND SEMESTER

COURSE CODE: BCA111

COURSE TITLE: ENGLISH LANGUAGE & COMPOSITION SKILLS

[Time allotted: Two hours]

[Max. Marks: 50]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(1 x 10 = 10)

- a. What is a technical proposal?
- b. Write any one difference between 'Curriculum vitae' and 'Resume.'
- c. Write the synonyms for the following:
(i) Tough (ii) External (iii) Initiate (iv) Short
- d. Write any four tools of preparing a presentation.
- e. Spell the following correctly:
(i) Intensan (ii) Kwairry (iii) Likar (iv) Bukey
- f. What do you know by a technical report?
- g. Make the sentences with given words:
(i) Succeed (ii) Arrangements
- h. Make two new words with the given suffix :
(i) _tion (ii) _al
- i. Use appropriate prepositions with following words and make a sentences:
(i) Refrain (ii) Surprise
- j. Correct the following sentences:
(i) I have completed my 10th in 2010. (ii) She shook hands of her husband.

SECTION B

Q. 2. Attempt any 4 questions.

(4 x 5 = 20)

- a. Discuss the origin and development of technical communication. Cite examples.
- b. Change as directed:
(i) Raj will complete his assignment in one hour. (To past perfect tense)
(ii) He had lost the match due to rain. (To future indefinite tense)
(iii) My friend has given me money. (To present indefinite tense)
(iv) My friend will take part in this game. (To present perfect tense)
(v) I have completed my task. (To passive voice)
(vi) He is driving a car. (To passive voice)
(vii) Open the door. (To passive voice)
(viii) He said to me, "Where are you going?" (To indirect speech)
(ix) My friend said, "Alas! We have lost the match." (To indirect speech)
(x) My mother said to me, "I am going to attend a party today." (To indirect speech)
- c. Discuss the difference between general and technical communication.
- d. Write a notice to your classmates informing them about a Poetry Writing Competition in your college. Invent required details.
- e. (i) Write a mail to your Class Coordinator and HOD of your branch inviting them to attend a workshop in your college. Invent necessary details. (3)
(ii) Write a short note on the importance of technical proposal. (80 words) (2)
- f. write a covering letter as per following advertisement:

The Hindustan Times' dated 5th July 2018, vacancy for the post of Software Engineers at Info Tech Pvt Ltd, Raipur, and Dehradun. Required Qualification: BCA. Fresher, may apply. Salary negotiable. Last date to apply: 20/07/2018

SECTION C

(10 x 2 = 20)

Attempt any 2 questions.

Q. 3. Assuming yourself a BCA Degree holder, draft a resume for yourself. Mention your name as Rakesh/ Rashmi.

Q. 4. Write an essay on any one of the following: (250-300 words)

(i) Importance of time management

(ii) Pollution

(iii) Employment scope in BCA

Q. 5. Read the following passage carefully and answer the questions given below.

Chess is called the game of the kings. It has been around for a long time. People have been playing it for over 500 years. Chess is based on even older game from India. The chess we play today is from Europe. Chess is two player game. One player uses white pieces and other black pieces. Each piece moves in a special way. One piece is called the king. Each player has one. The players take turns moving their pieces. If a player lands on a piece, he or she takes it. The game ends when a player loses his or her king. There are a few more rules, but those are the basic ones. Some people think that chess is more than a game. They think that it makes the mind stronger. Good chess players use their brains. They take their time. They think about what will happen next. These skills are useful in life and in chess. Chess is kind of like a work out for the mind. You don't always have lots of time to think while playing chess. There is a type of chess with short time limits. It's called blitz chess. In blitz chess, each player has ten minutes to use for the whole game. Your clock runs during your turn. You hit the time clock after your move. This stops your clock. It also starts the other player's clock. If you run out of time, you lose. Games of blitz chess are fast-paced.

Chess is not just for people. Computers have been playing chess since the 1970s. At first they did not play well. They made mistakes. As time went on they grew stronger. In 1997, a computer beat the best player in the world for the first time. It was a computer called Deep Blue. Deep Blue was big. It took up a whole room. By 2006 a phone could beat the best players in the world. Chess sure has come a long way. Don't you think so?

- What is author's purpose in writing the second paragraph?
- Why is chess good for people?
- How is blitz chess more challenging to play than regular chess?
- How have computer chess programs changed over time?
- Write the summary of the above passage in 60 words.

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END SEMESTER EXAMINATIONS, JUNE - 2018
PROGRAM: BCA SECOND SEMESTER

COURSE CODE : BCA112**COURSE TITLE : FOUNDATION COURSE IN MATHEMATICS - II****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 × 10 = 20)**

- a. Write statistical definition of probability.
- b. What is the probability of a null event?
- c. Write the polar form of complex number i .
- d. In which range the value of correlation falls.
- e. Find the distance between $(5, -2, 1)$ and $(-1, -3, -2)$.
- f. Write the solution of differential equation $\frac{dy}{dx} + Py = Q$, where $P = P(x)$ and $Q = Q(x)$.
- g. In a class of 10 students, 4 are boys and rest are girls. Find the probability that a student selected will be a girl?
- h. Write the vector equation of a plane passing through the point having position vector $\vec{a}$ and normal to vector $\vec{n}$.
- i. Convert $(1 + i)/(1 - i)$ to the form of $(a + ib)$.
- j. Find the intercepts of line $2x - 3y = 6$ by axis.

SECTION B**Q. 2.** Attempt any 5 questions.**(7 × 5 = 35)**

- a. Find the coordinate of the foot of the perpendicular drawn from the point $A(1, 2, 1)$ to the line joining the points $B(1, 4, 6)$ and $C(5, 4, 4)$.
- b. Find the mode of the given data:

Interval	01-05	06-10	11-15	16-20	21-25	26-30	31-35	36-40
Frequency	7	10	16	32	24	18	10	5

- c. Find the value of λ , for which the differential equation :
 $(xy^2 + \lambda x^2 y)dx + (x + y)x^2 dy = 0$ is exact. Hence, solve the equation for this value of λ .
- d. If $\cos \alpha + \cos \beta + \cos \gamma = \sin \alpha + \sin \beta + \sin \gamma = 0$ and $a + b + c = 0$, prove that
 $\cos 2\alpha + \cos 2\beta + \cos 2\gamma = 0$ and $\sin 2\alpha + \sin 2\beta + \sin 2\gamma = 0$.
- e. Solve the differential equation $(D^2 - 6D + 13)y = -\log 2 + 2^x$.
- f. Find the square root of the complex number $3 + 4i$.
- g. Solve the differential equation $\frac{dy}{dx} \cos^3 x + y \cos x = \sin x$.

SECTION C

Attempt any 3 questions.

(15 × 3 = 45)

- Q. 3. a.** Convert the following into $A + iB$ form :

$$\frac{1}{1-2i} + \frac{4}{1+6i}.$$

- b.** if $2 \cos \theta = x + \frac{1}{x}$ and $2 \cos \phi = y + \frac{1}{y}$, prove that

(7.5)

$$(i) 2 \cos(\theta + \phi) = xy + \frac{1}{xy} \quad (ii) 2 \cos(\theta - \phi) = \frac{x}{y} + \frac{y}{x}.$$

- Q. 4. a.** Formulate the differential equation of the curve $y^2 = Ax^2 + Bx + C$. Hence, write the order and degree of the differential equation.

(7.5)

- b.** Apply the method of the variation of parameters to solve the differential equation :

$$\frac{d^2 y}{dx^2} + y = \operatorname{cosec} x.$$

(7.5)

- Q. 5. a.** Given that 10% of the bolts produced by a machine are defective. Using binomial distribution, determine the probability that out of 10 bolts chosen at random :

(7.5)

- (i) 1 (ii) none, (iii) at most 2, (iv) at least 2 bolts will be defective.

- b.** Find the vector equation of the line through $A(3, 4, -7)$ and $B(1, -1, 6)$. Also find its Cartesian form.

(7.5)

- Q. 6. a.** To prove that the vector equation of a line passing through two points with position vectors

(7.5)

$$\vec{a} \text{ and } \vec{b}, \text{ is } \vec{r} = \vec{a} + \lambda(\vec{b} - \vec{a}).$$

- b.** Solve the differential equation:

(7.5)

$$\frac{dy}{dx} \cos^3 x + y \cos x = \sin x.$$

- Q. 7. a.** If a incomplete frequency distribution is given below :

(7.5)

Interval	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	12	30	f_1	65	f_2	25	18

Find f_1 and f_2 , if median is 46 and total frequency is 229.

- b.** Solve the following differential equation :

(7.5)

$$\sec^2 x \tan y dx + \sec^2 y \tan x dy = 0.$$

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END SEMESTER EXAMINATIONS, JULY-2018**PROGRAM : BCA SECOND SEMESTER****COURSE CODE : BCA107****COURSE TITLE : PROGRAMMING CONCEPTS USING C LANGUAGE****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****(2 x 10 = 20)****Q. 1.** Attempt all questions.

- a. What do you understand by a flow chart?
- b. Differentiate between formatted console I/O functions and unformatted console I/O functions.
- c. What is an operator? Explain with a suitable example.
- d. What is free-form language? Is 'C' Language a free-form language?
- e. Give the name of five library functions used in C language.
- f. What do you understand by conditional operator? Explain.
- g. What is the difference between scanf() function and gets () function?
- h. Define macro with a suitable example.
- i. Give the name of three string handling functions.
- j. Who is the inventor of C language and where is it developed?

SECTION B**(7 x 5 = 35)****Q. 2.** Attempt any 5 questions.

- a. Differentiate between implicit type-conversion and explicit type- conversion.
- b. What is storage class? Explain each in brief.
- c. What is structure? How is it different from union? Explain with a suitable example.
- d. Write a program to calculate compound-interest, i.e. $V = P(1+r/n)^{nt}$, where V is final amount after t year, P is a principal amount, r is a rate of interest, t is a time and n is the number of times that interest is compounded per year.
- e. What do you mean by precedence and associativity of an operator? Explain with a suitable example.
- f. Write a program to find length of the entered string without using string handling function.
- g. What is recursion? Explain with a suitable example.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.**
 - a. What is function? Differentiate between library functions and user-defined functions. **(7)**
 - b. Write a program to print Fibonacci series using function. i.e. 1 1 2 3 5 8..... **(8)**
- Q. 4.**
 - a. What is an array? Explain different types of arrays used in C. **(8)**
 - b. Write a program to declare an array of order 3x3 and takes input through the keyboard. Find out the largest number among entered numbers. **(7)**
- Q. 5.**
 - a. What is dynamic-memory allocation? Explain with a suitable example. **(7)**
 - b. Write a program to allocate memory dynamically for 10-elements. Take inputs through the keyboard and find the largest entered element. **(8)**
- Q. 6.**
 - a. What is the different between 'break' and 'continue' statement? Explain with a suitable example. **(7)**
 - b. Differentiate between while loop and do-while loop using a flow chart. **(8)**
- Q. 7.**
 - a. What is an algorithm? Explain with a suitable example. **(7)**
 - b. Compare top-down and bottom-up software design approaches. **(8)**

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END SEMESTER EXAMINATIONS, JUNE-2018**PROGRAM : BCA****SECOND SEMESTER****COURSE CODE : BCA109****COURSE TITLE : DATA COMMUNICATION AND COMPUTER NETWORKS****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections and Questions.**SECTION A****(2 x 10 = 20)****Q.1.** Attempt **all** questions.

- a. Explain what is a port address?
- b. What is MAC address?
- c. How many layers are there in TCP/IP?
- d. What is UDP?
- e. How many types of switching are there in computer networks?
- f. What is ALOHA?
- g. What is CRC?
- h. Explain WDMA.
- i. What is BGP?
- j. What is PAT?

SECTION B**(7 x 5 = 35)****Q.2.** Attempt **any 5** questions.

- a. Explain all network topologies and their advantages.
- b. What is the difference between LAN, WAN and MAN?
- c. What are IEEE802 standards and why is it important?
- d. What is DVR? How it works and why is it important?
- e. What do you understand by virtual LAN? Why is it important?
- f. How does the DNS work and why is it important for internet?
- g. What is routing? Why routing protocols used?

SECTION CAttempt **any 3** questions.**(15 x 3 = 45)**

- Q.3.**
- a. What are the characteristics of computer networks? 7.5
 - b. Why encoding is required in computer network? Explain in detail. 7.5

- Q.4.**
- a. What is CRC explain your answer with the help of an example. 7.5
 - b. Explain all functionalities of data link layer in detail. 7.5

- Q.5.**
- a. Explain the working of RIP in detail with the help of a diagram. 7.5
 - b. What is the concept of subnet? Explain your answer with the help of an example. 7.5

- Q.6.**
- a. Explain all types of switching techniques in detail. 7.5
 - b. Explain NAT and PAT in detail. Why is it used? 7.5

- Q.7.**
- a. Explain computer network client server architecture. 7.5
 - b. Explain the working of TELNET in detail. Why is it important? 7.5

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END SEMESTER EXAMINATION, JUNE - 2018

PROGRAM: BCA SECOND SEMESTER

COURSE CODE: BCA111

COURSE TITLE: ENGLISH LANGUAGE & COMPOSITION SKILLS

[Time allotted: Two hours]

[Max. Marks: 50]

Note: Attempt all Sections & Questions.

SECTION A

(1 x 10 = 10)

Q. 1. Attempt all questions.

- What is a technical proposal?
- Write any one difference between 'Curriculum vitae' and 'Resume.'
- Write the synonyms for the following:
(i) Tough (ii) External (iii) Initiate (iv) Short
- Write any four tools of preparing a presentation.
- Spell the following correctly:
(i) Intensan (ii) Kwairry (iii) Likar (iv) Bukey
- What do you know by a technical report?
- Make the sentences with given words:
(i) Succeed (ii) Arrangements
- Make two new words with the given suffix :
(i) _tion (ii) _al
- Use appropriate prepositions with following words and make a sentences:
(i) Refrain (ii) Surprise
- Correct the following sentences:
(i) I have completed my 10th in 2010. (ii) She shook hands of her husband.

SECTION B

(4 x 5 = 20)

Q. 2. Attempt any 4 questions.

- Discuss the origin and development of technical communication. Cite examples.
- Change as directed:
 - Raj will complete his assignment in one hour. (To past perfect tense)
 - He had lost the match due to rain. (To future indefinite tense)
 - My friend has given me money. (To present indefinite tense)
 - My friend will take part in this game. (To present perfect tense)
 - I have completed my task. (To passive voice)
 - He is driving a car. (To passive voice)
 - Open the door. (To passive voice)
 - He said to me, "Where are you going?" (To indirect speech)
 - My friend said, "Alas! We have lost the match." (To indirect speech)
 - My mother said to me, "I am going to attend a party today." (To indirect speech)
- Discuss the difference between general and technical communication.
- Write a notice to your classmates informing them about a Poetry Writing Competition in your college. Invent required details.
- Write a mail to your Class Coordinator and HOD of your branch inviting them to attend a workshop in your college. Invent necessary details. (3)
 - Write a short note on the importance of technical proposal. (80 words) (2)
- write a covering letter as per following advertisement:

The Hindustan Times' dated 5th July 2018, vacancy for the post of Software Engineers at Info Tech Pvt Ltd, Raipur, and Dehradun. Required Qualification: BCA. Fresher may apply. Salary negotiable. Last date to apply: 20/07/2018

SECTION C

Attempt any 2 questions.

(10 x 2 = 20)

Q. 3. Assuming yourself a BCA Degree holder, draft a resume for yourself. Mention your name as Rakesh/ Rashmi.

Q. 4. Write an essay on any one of the following: (250-300 words)

(i) Importance of time management

(ii) Pollution

(iii) Employment scope in BCA

Q. 5. Read the following passage carefully and answer the questions given below.

Chess is called the game of the kings. It has been around for a long time. People have been playing it for over 500 years. Chess is based on even older game from India. The chess we play today is from Europe. Chess is two player game. One player uses white pieces and other black pieces. Each piece moves in a special way. One piece is called the king. Each player has one. The players take turns moving their pieces. If a player lands on a piece, he or she takes it. The game ends when a player loses his or her king. There are a few more rules, but those are the basics. Some people think that chess is more than a game. They think that it makes the mind stronger. Good chess players use their brains. They take their time. They think about what will happen next. These skills are useful in life and in chess. Chess is kind of like a work out for the mind. You don't always have lots of time to think when playing chess. There is a type of chess with short time limits. It's called blitz chess. In blitz chess, each player gets ten minutes to use for the whole game. Your clock runs during your turn. You hit the time clock after your move. This stops your clock. It also starts the other player's clock. If you run out of time, you lose. Games of blitz chess are fast-paced.

Chess is not just for people. Computers have been playing chess since the 1970s. At first they did not play well. They made mistakes. As time went on they grew stronger. In 1997, a computer beat the best player in the world for the first time. It was a computer called Deep Blue. Deep Blue was big. It took up a whole room. By 2006 a cell phone could beat the best players in the world. Chess sure has come a long way. Don't you think so?

a. What is author's purpose in writing the second paragraph?

(1)

b. Why is chess good for people?

(1)

c. How is blitz chess more challenging to play than regular chess?

(2)

d. How have computer chess programs changed over time?

(2)

e. Write the summary of the above passage in 60 words.

(4)

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END SEMESTER EXAMINATIONS, JUNE - 2018**PROGRAM: BCA SECOND SEMESTER****COURSE CODE : BCA110****COURSE TITLE : DATA STRUCTURES****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. Define a circularly singly linked-list with a suitable example.
- b. Explain 'Overflow' and 'Underflow' conditions with respect to an array.
- c. What is the minimum number of queues required to implement the priority queue?
- d. Which data structure is used to perform recursion?
- e. Define a hash table.
- f. A binary tree with 20 nodes has.....NULL branches.
- g. What is garbage collection?
- h. Explain extended binary tree with a suitable example.
- i. What is complexity? Explain time and space complexity.
- j. What is data structure? Draw the hierarchy of different types of data structures.

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. Define sparse-matrix. Write a program to multiply two sparse matrices.
- b. Write an algorithm which counts the number of nodes in a singly linked list.
- c. Evaluate the following postfix expression
P: 3, 5, +, 6, 4, -, *, 4, 1, -, 2, ↑, +.
- d. Suppose the following sequence list the nodes of a binary tree T in preorder and inorder, respectively:
Preorder: G, B, Q, A, C, K, F, P, D, E, R, H
Inorder: Q, B, K, C, F, A, G, P, E, D, H, R
Draw the diagram of tree T and also calculate postorder traversal of T.
- e. What is collision? Explain different types of collision-resolution techniques.
- f. Write and explain Huffman's algorithm with a suitable example.
- g. Sort the given values using Quick sort.
65, 70, 75, 80, 85, 60, 55, 50, 45

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.** Consider the following 4-digit employee numbers: 9614, 5882, 6713, 4409, 1825. Find the 2-digit hash address of each number using
 - a. Division method, with m=97.
 - b. Midsquare method.
 - c. Folding method with reversing.
- Q. 4.**
 - a. Describe briefly the difference between local variables, parameters and global variables.
 - b. What is recursion? Explain direct and indirect recursions with the suitable examples.
- Q. 5.** Consider the linear array XXX (-10:10), YYY (1935:1985), ZZZ (35).
 - a. Find the number of elements in each array.

- b. Suppose Base (YYY) = 400 and $w = 4$ words per memory cell for YYY. Find the address of YYY [1942], YYY [1977] and YYY [1988].

Q. 6. Consider the following stack, where STACK is allocated N=6 memory cells

STACK: AAA, DDD, EEE, FFF, GGG, _____

Describe the stack as the following operations take place (in sequence):

- PUSH(STACK, KKK)
- POP(STACK, ITEM)
- PUSH(STACK, LLL)
- PUSH(SSS)
- POP(STACK, ITEM)

Q. 7. Suppose a queue is maintained by a circular array QUEUE with N=12 memory cells. Find the number of elements in QUEUE and also draw the current status of QUEUE, if-

- FRONT=4, REAR=8.
- FRONT= 10, REAR=3.
- FRONT=5, REAR=6 and then two elements are deleted.

Enrol. No.

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END SEMESTER EXAMINATIONS, JUNE - 2018

PROGRAM: BCA

SECOND SEMESTER

COURSE CODE : BCA112

COURSE TITLE : FOUNDATION COURSE IN MATHEMATICS - II

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(2 × 10 = 20)

- Write statistical definition of probability.
- What is the probability of a null event?
- Write the polar form of complex number i .
- In which range the value of correlation falls.
- Find the distance between $(5, -2, 1)$ and $(-1, -3, -2)$.
- Write the solution of differential equation $\frac{dy}{dx} + Py = Q$, where $P = P(x)$ and $Q = Q(x)$.
- In a class of 10 students, 4 are boys and rest are girls. Find the probability that a student selected will be a girl?
- Write the vector equation of a plane passing through the point having position vector $\vec{a}$ and normal to vector $\vec{n}$.
- Convert $(1+i)/(1-i)$ to the form of $(a+ib)$.
- Find the intercepts of line $2x - 3y = 6$ by axis.

SECTION B

Q. 2. Attempt any 5 questions.

(7 × 5 = 35)

- Find the coordinate of the foot of the perpendicular drawn from the point $A(1, 2, 1)$ to the line joining the points $B(1, 4, 6)$ and $C(5, 4, 4)$.
- Find the mode of the given data:

Interval	01-05	06-10	11-15	16-20	21-25	26-30	31-35	36-40
Frequency	7	10	16	32	24	18	10	5

- Find the value of λ , for which the differential equation :

$(xy^2 + \lambda x^2 y)dx + (x + y)x^2 dy = 0$ is exact. Hence, solve the equation for this value of λ .

- If $\cos \alpha + \cos \beta + \cos \gamma = \sin \alpha + \sin \beta + \sin \gamma = 0$ and $a + b + c = 0$, prove that

$$\cos 2\alpha + \cos 2\beta + \cos 2\gamma = 0 \text{ and } \sin 2\alpha + \sin 2\beta + \sin 2\gamma = 0.$$

- Solve the differential equation $(D^2 - 6D + 13)y = -\log 2 + 2^x$.

- Find the square root of the complex number $3 + 4i$.

- Solve the differential equation $\frac{dy}{dx} \cos^3 x + y \cos x = \sin x$.

SECTION C

Attempt **any 3** questions.

(15 × 3 = 45)

- Q. 3.** a. Convert the following into $A + iB$ form :

$$\frac{1}{1-2i} + \frac{4}{1+6i}.$$

- b. if $2 \cos \theta = x + \frac{1}{x}$ and $2 \cos \phi = y + \frac{1}{y}$, prove that

(7.5)

$$(i) 2 \cos(\theta + \phi) = xy + \frac{1}{xy} \quad (ii) 2 \cos(\theta - \phi) = \frac{x}{y} + \frac{y}{x}.$$

- Q. 4.** a. Formulate the differential equation of the curve $y^2 = Ax^2 + Bx + C$. Hence, write the order and degree of the differential equation.

- b. Apply the method of the variation of parameters to solve the differential equation :

$$\frac{d^2 y}{dx^2} + y = \operatorname{cosec} x.$$

- Q. 5.** a. Given that 10% of the bolts produced by a machine are defective. Using binomial distribution, determine the probability that out of 10 bolts chosen at random :

- (i) 1 (ii) none, (iii) at most 2, (iv) at least 2 bolts will be defective.

- b. Find the vector equation of the line through $A(3, 4, -7)$ and $B(1, -1, 6)$. Also find its Cartesian form.

- Q. 6.** a. To prove that the vector equation of a line passing through two points with position vectors

$$\vec{a} \text{ and } \vec{b}, \text{ is } \vec{r} = \vec{a} + \lambda(\vec{b} - \vec{a}).$$

- b. Solve the differential equation:

$$\frac{dy}{dx} \cos^3 x + y \cos x = \sin x.$$

- Q. 7.** a. If a incomplete frequency distribution is given below :

Interval	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	12	30	f_1	65	f_2	25	18

Find f_1 and f_2 , if median is 46 and total frequency is 229.

- b. Solve the following differential equation :

$$\sec^2 x \tan y dx + \sec^2 y \tan x dy = 0.$$

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JUNE - 2018
PROGRAM : BCA **SECOND SEMESTER**

COURSE CODE : BCA113**COURSE TITLE : FUNDAMENTALS OF ACCOUNTING AND FINANCE****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions. Write short notes on the following:**(2 x 10 = 20)**

- | | |
|----------------------|---------------------------|
| a. Balance Sheet | f. Raw Material |
| b. Owner's Equity | g. Inventory |
| c. Income Statement | h. Sundry Creditors |
| d. Accounting Period | i. Break Even Point |
| e. Finished Goods | j. Dematerialized Account |

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- Explain in detail money measurement and accrual concept of Accounting.
- What you understand by the convention of disclosure in Accounting?
- Define Break Even Point. Is it acceptable for a new business?
- Differentiate between Capital Market and Money Market.
- How the functions of accountant differ for external user and internal user?
- Calculate Quick Ratio where Stock = Rs. 80,000; Working Capital = Rs. 2,40,000; and Current Assets = Rs. 4,00,000. Write names of any two money market instruments.
- Describe various sections of Balance Sheet.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.** Explain three accounting conventions in detail. **(5*3)**
- Q. 4.** Write the process of Accounting. **(15)**
- Q. 5.** Write the process of Common Size Statement Analysis. **(15)**
- Q. 6.** Ironically, Satyam means "truth" in the ancient Indian language "Sanskrit". Satyam won the "Golden Peacock Award" for the best governed company in 2007 and in 2009. From being India's IT "crown jewel" and the country's "fourth largest" company with high-profile customers, the outsourcing firm Satyam Computers has become embroiled in the nation's biggest corporate scam in living memory. Mr. Ramalinga Raju (Chairman and Founder of Satyam; henceforth called "Raju"), who has been arrested and has confessed to a \$1.47 billion (or Rs. 7800 crore) fraud, admitted that he had made up profits for years. According to reports, Raju and his brother, B. Rama Raju, who was the Managing Director, "hid the deception from the company's board, senior managers, and auditors". The case of Satyam's accounting fraud has been dubbed as "India's Enron".
- Why is Satyam labelled as "India's Enron"? **(7.5)**
 - What were the factors that contributed to the "unethical" decisions made by the company's executives? **(7.5)**
- Q. 7.** What is financial management? What is significance of financial management to modern organizations? **(15)**

27/6

BCA

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JUNE-2018

PROGRAM : BCA SECOND SEMESTER

COURSE CODE : BCA114

COURSE TITLE : HUMAN VALUES AND PROFESSIONAL ETHICS

[Time allotted: Two hours]

[Max. Marks: 50]

Note: Attempt all Sections and Questions.

SECTION A

Q. 1. Attempt all questions.

(1 x 10 = 10)

a. Fill In the blanks:

1. is the author of the book 'Das Capital'.
2. is the nucleus of social structure.

b. What is Slag Code?

c. What is software piracy?

d. What do you mean by advance expertise?

e. What is alienation?

f. Find True or False:

- i. Sati Pratha is an example of anomic suicide.
- ii. Asteya means non-hypocrisy.

g. Short Answers:

- i. Who gave the theory of Id, Ego and Super Ego?
 - ii. What is self-help skill?
- h. Distinguish between professionalism and professional ethics.
- i. What do you mean by nepotism?
 - j. What is informal social control?

SECTION B

Q. 2. Attempt any 4 questions.

(4 x 5 = 20)

- a. Distinguish family on the basis of dominance and property.
- b. Discuss the 'Theory of Identity' in establishing harmony between self and body.
- c. Discuss the purpose of self-exploration.
- d. Define Profession. Discuss its characteristics.
- e. Discuss the function of family.
- f. Define yamas. Discuss its types.

SECTION C

Attempt any 2 questions.

(10 x 2 = 20)

Q. 3. a. Discuss the need of value education.

(5)

b. Discuss the role of value system as an informal social control.

(5)

Q. 4. a. Explain the Roles of Codes of Professional Ethics.

(5)

b. Discuss different types of cybercrimes found in India.

(5)

Q. 5. a. Discuss Indian Value system with special reference to purushathas and niyamas.

(5)

b. Discuss value crises at intellectual level.

(5)

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END SEMESTER EXAMINATIONS, JUNE - 2018**PROGRAM: BCA SECOND SEMESTER****COURSE CODE : BCA110****COURSE TITLE : DATA STRUCTURES****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt **all** questions.**(2 x 10 = 20)**

- a. Define a circularly singly linked-list with a suitable example.
- b. Explain 'Overflow' and 'Underflow' conditions with respect to an array.
- c. What is the minimum number of queues required to implement the priority queue?
- d. Which data structure is used to perform recursion?
- e. Define a hash table.
- f. A binary tree with 20 nodes has.....NULL branches.
- g. What is garbage collection?
- h. Explain extended binary tree with a suitable example.
- i. What is complexity? Explain time and space complexity.
- j. What is data structure? Draw the hierarchy of different types of data structures.

SECTION B**Q. 2.** Attempt **any 5** questions.**(7 x 5 = 35)**

- a. Define sparse-matrix. Write a program to multiply two sparse matrices.
- b. Write an algorithm which counts the number of nodes in a singly linked list.
- c. Evaluate the following postfix expression
P: 3, 5, +, 6, 4, -, *, 4, 1, -, 2, ↑, +.
- d. Suppose the following sequence list the nodes of a binary tree T in preorder and inorder, respectively:
Preorder: G, B, Q, A, C, K, F, P, D, E, R, H
Inorder: Q, B, K, C, F, A, G, P, E, D, H, R
Draw the diagram of tree T and also calculate postorder traversal of T.
- e. What is collision? Explain different types of collision-resolution techniques.
- f. Write and explain Huffman's algorithm with a suitable example.
- g. Sort the given values using Quick sort.
65, 70, 75, 80, 85, 60, 55, 50, 45

SECTION CAttempt **any 3** questions.**(15 x 3 = 45)**

- Q. 3.** Consider the following 4-digit employee numbers: 9614, 5882, 6713, 4409, 1825. Find the 2-digit hash address of each number using
 - a. Division method, with m=97. 5
 - b. Midsquare method. 5
 - c. Folding method with reversing. 5
- Q. 4.**
 - a. Describe briefly the difference between local variables, parameters and global variables. 7
 - b. What is recursion? Explain direct and indirect recursions with the suitable examples. 8
- Q. 5.** Consider the linear array XXX (-10:10), YYY (1935:1985), ZZZ (35).
 - a. Find the number of elements in each array. 7

- b. Suppose Base (YYY) = 400 and w= 4 words per memory cell for YYY. Find the address of YYY [1942], YYY [1977] and YYY [1988].

8

Q. 6. Consider the following stack, where STACK is allocated N=6 memory cells

STACK: AAA, DDD, EEE, FFF, GGG, _____

Describe the stack as the following operations take place (in sequence):

- PUSH(STACK, KKK)
- POP(STACK, ITEM)
- PUSH(STACK, LLL)
- PUSH(SSS)
- POP(STACK, ITEM)

3

3

3

3

3

Q. 7. Suppose a queue is maintained by a circular array QUEUE with N=12 memory cells. Find the number of elements in QUEUE and also draw the current status of QUEUE, if-

- FRONT=4, REAR=8.
- FRONT= 10, REAR=3.
- FRONT=5, REAR=6 and then two elements are deleted.

5

SECTION B

Q. 2. Answer any 3 questions.

(7 x 5 = 35)

- Define queue-structure. Write a program to implement queue-structure.
- Write an algorithm which counts the number of nodes in a singly linked list.
- Evaluate the following postfix expression:
 $2, 3, +, 4, 4, -, *, +, 1, -, 2, /, +$
- Suppose the following sequence list the nodes of a binary tree in preorder and inorder, respectively.
 Preorder: G, B, Q, A, C, E, F, P, D, E, R, H
 Inorder: Q, B, E, C, A, G, R, E, D, H, F
 Draw the diagram of tree T and also calculate postorder traversal of T.
- What is collision? Explain different types of collision-resolution techniques.
- Write and explain Huffman's algorithm with a suitable example.
- Sort the given values using Quick sort.
 65, 70, 75, 80, 85, 90, 95, 99, 45

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

Q. 3. Consider the following 4-digit employee numbers: 9814, 3882, 5713, 4409, 1825. Find the 2-digit hash address of each number using

- Division method with m=97.
- Residue method.
- Folding method with reversing.

3

3

3

Q. 4. a. Describe briefly the difference between local variables, parameters and global variables.

7

b. What is recursion? Explain direct and indirect recursions with the suitable examples.

3

Q. 5. Consider the linear array X[X] (10:10), Y[Y] (1945:1985), Z[Z] (35).

a. Find the number of elements in each array.

7

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END SEMESTER EXAMINATION, JUNE-2018
PROGRAM : BCA SECOND SEMESTER

COURSE CODE : BCA108**COURSE TITLE : ADVANCE CONCEPTS OF 'C' PROGRAMMING****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.**(2 x 10 = 20)**

- a. What is pointer? Write down a program to swap two integers with the help of call by reference.
- b. What is dangling pointer?
- c. What is an array?
- d. What are the roles of the C preprocessor? How C preprocessor is different from C Compiler?
- e. What are command line arguments?

Find the output of the following programs. Assume stdio.h is included in all programs

- f.

```
int main()
{
    int a[5]={1},b[5]={1};
    if (a=b)
        printf("Same\n");
    else
        printf("Different\n");
    return 0;
}
```
- g.

```
int main()
{
    int arr[8]={ 10,11,12,13,20,21,22,23};
    int *p,*q;
    q=arr/2;
    p=q*2;
    printf("%d %d",*p,*q);
    return 0;
}
```
- h.

```
int main()
{
    int i, arr[5]={ 25,30,35,40,45},*p;
    p=arr;
    for (i=0;i<5;i++)
        printf("%d\t%d\t",*(p+i),p[i]);
    return 0;
}
```
- i.

```
int main(void)
{
    int a=9;
    if(a=5)
        printf("a if five\t");
    else
        printf("a is not five\t");
    printf("value of a is %d \n",a);
    return 0;
}
```

```

j. int main(void)
{
    int i=10;
    if(i==50)
        printf("a if fifty\t");
    else
        printf("a is not fifty\t");
    return 0;
}

```

SECTION B

Q. 2. Attempt **any 5** questions.

(7 x 5 = 35)

- What are the different storage classes in C? Explain in term of storage, default initial value, scope and life.
- What is Bit-Fields? How it is useful for C programming? Demonstrate with the help of program.
- What is the role of Files in C? Differentiate between text and binary streams. Also explain the usefulness of buffer.
- What is Bit Mask? Write down the program that converts decimal numbers (0 to 15) into binary using bit mask.
- Define the header file. How to create the user define header file for sum of two value. Write down the program for that.
- Write a function that inputs a binary number and convert to decimals.
- What is recursive function? Write down the program that generates the Fibonacci series.

SECTION C

Attempt **any 3** questions.

(15 x 3 = 45)

- Q. 3.** Give the brief introduction about Input-output system calls in C. Write the program used for Open the file for reading, writing or both. (15)
- Q. 4.**
 - Differentiate between recursion and iteration. What is tail recursion? Explain with the help of program. (7.5)
 - What is memory architecture of two dimensional arrays? Write down the program for addition of two matrices. (7.5)
- Q. 5.**
 - Define C preprocessor. Write down the program to understand the use of #if directive. (7.5)
 - Write down the program to use of #else directive. (7.5)
- Q. 6.**
 - What are the different functions used for file I/O. Explain the role of each function in brief. (7.5)
 - What are the Bitwise Operators? Write down the program to find out the whether a number is even or odd. (7.5)
- Q. 7.**
 - What is pixel? Write down the program to draw the line and circle in graph mode. (7.5)
 - Differentiate between structure and union. Also write down the program that contains structure as well as union. (7.5)

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JUNE-2018

PROGRAM : BCA SECOND SEMESTER

COURSE CODE : BCA109

COURSE TITLE : DATA COMMUNICATION AND COMPUTER NETWORKS

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections and Questions.

SECTION A

Q.1. Attempt all questions.

(2 x 10 = 20)

- a. Explain what is a port address?
- b. What is MAC address?
- c. How many layers are there in TCP/IP?
- d. What is UDP?
- e. How many types of switching are there in computer networks?
- f. What is ALOHA?
- g. What is CRC?
- h. Explain WDMA.
- i. What is BGP?
- j. What is PAT?

SECTION B

Q.2. Attempt any 5 questions.

(7 x 5 = 35)

- a. Explain all network topologies and there advantages.
- b. What is the difference between LAN, WAN and MAN?
- c. What are IEEE802 standards and why is it important?
- d. What is DVR? How it works and why is it important?
- e. What do you understand by virtual LAN? Why is it important?
- f. How does the DNS work and why is it important for internet?
- g. What is routing? Why routing protocols used?

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q.3.
 - a. What are the characterstics of computer networks? 7.5
 - b. Why encoding is required in computer network? Explain in detail. 7.5
- Q.4.
 - a. What is CRC explain your answer with the help of an example. 7.5
 - b. Explain all fuctionalities of data link layer in detail. 7.5
- Q.5.
 - a. Explain the working of RIP in detail with the help of a diagram. 7.5
 - b. What is the concept of subnet? Explain your answer with the help of an example. 7.5
- Q.6.
 - a. Explain all types of switching techniques in detail. 7.5
 - b. Explain NAT and PAT in detail. Why is it used? 7.5
- Q.7.
 - a. Explain computer network client server architecture. 7.5
 - b. Explain the working of TELNET in detail. Why is it important? 7.5

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END SEMESTER EXAMINATIONS, JUNE-2018

PROGRAM : BCA SECOND SEMESTER

COURSE CODE : BCA114

COURSE TITLE : HUMAN VALUES AND PROFESSIONAL ETHICS

[Time allotted: Two hours]

[Max. Marks: 50]

Note: Attempt all Sections and Questions.

SECTION A

Q. 1. Attempt all questions.

(1 x 10 = 10)

a. **Fill In the blanks:**

1. is the author of the book 'Das Capital'.
2. is the nucleus of social structure.

b. What is Slag Code?

c. What is software piracy?

d. What do you mean by advance expertise?

e. What is alienation?

f. **Find True or False:**

i. Sati Pratha is an example of anomic suicide.

ii. Asteya means non-hypocrisy.

g. **Short Answers:**

i. Who gave the theory of Id, Ego and Super Ego?

ii. What is self-help skill?

h. Distinguish between professionalism and professional ethics.

i. What do you mean by nepotism?

j. What is informal social control?

SECTION B

Q. 2. Attempt any 4 questions.

(4 x 5 = 20)

a. Distinguish family on the basis of dominance and property.

b. Discuss the 'Theory of Identity' in establishing harmony between self and body.

c. Discuss the purpose of self-exploration.

d. Define Profession. Discuss its characteristics.

e. Discuss the function of family.

f. Define yamas. Discuss its types.

SECTION C

Attempt any 2 questions.

(10 x 2 = 20)

Q. 3. a. Discuss the need of value education.

b. Discuss the role of value system as an informal social control.

Q. 4. a. Explain the Roles of Codes of Professional Ethics.

b. Discuss different types of cybercrimes found in India.

Q. 5. a. Discuss Indian Value system with special reference to purushathas and niyamas.

b. Discuss value crises at intellectual level.

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END SEMESTER EXAMINATIONS, JULY-2018**PROGRAM : BCA****SECOND SEMESTER****COURSE CODE : BCA107****COURSE TITLE : PROGRAMMING CONCEPTS USING C LANGUAGE****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- What do you understand by a flow chart?
- Differentiate between formatted console I/O functions and unformatted console I/O functions.
- What is an operator? Explain with a suitable example.
- What is free-form language? Is 'C' Language a free-form language?
- Give the name of five library functions used in C language.
- What do you understand by conditional operator? Explain.
- What is the difference between scanf() function and gets () function?
- Define macro with a suitable example.
- Give the name of three string handling functions.
- Who is the inventor of C language and where is it developed?

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- Differentiate between implicit type-conversion and explicit type- conversion.
- What is storage class? Explain each in brief.
- What is structure? How is it different from union? Explain with a suitable example.
- Write a program to calculate compound-interest, i.e. $V = P (1+r/n)^{nt}$, where V is final amount after t years, P is a principal amount, r is a rate of interest, t is a time and n is the number of times that interest is compounded per year.
- What do you mean by precedence and associativity of an operator? Explain with a suitable example.
- Write a program to find length of the entered string without using string handling function.
- What is recursion? Explain with a suitable example.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- What is function? Differentiate between library functions and user-defined functions.
 - Write a program to print Fibonacci series using function. i.e. 1 1 2 3 5 8.....
- What is an array? Explain different types of arrays used in C.
 - Write a program to declare an array of order 3x3 and takes input through the keyboard. Find out the largest number among entered numbers.
- What is dynamic-memory allocation? Explain with a suitable example.
 - Write a program to allocate memory dynamically for 10-elements. Take inputs through the keyboard and find the largest entered element.
- What is the different between 'break' and 'continue' statement? Explain with a suitable example.
 - Differentiate between while loop and do-while loop using a flow chart.
- What is an algorithm? Explain with a suitable example.
 - Compare top-down and bottom-up software design approaches.

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END SEMESTER EXAMINATIONS, JULY-2018

PROGRAM : BCA THIRD SEMESTER

COURSE CODE : BCA204

COURSE TITLE : OPERATING SYSTEM

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

- What is thrashing?
- Why do we do page replacement? Explain.
- Explain the degree of multiprogramming.
- What are semaphores?
- Explain run time address binding.
- Define Belady's anomaly problem in FIFO.
- What is operating system? Explain the function of operating systems.
- Differentiate between hard real time system & soft real time system.
- What do you mean by RAG?
- What do you mean by fragmentation?

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- Under what circumstances page faults occur? Describe the actions taken by the operating system when a page fault occurs.
- Consider a system with 4 processes. Each requires 2 units of resources to complete the execution, then what is the minimum number of resources required to avail deadlock free environment?
- What is tape? Explain with the help of diagram.
- Explain various necessary conditions for the deadlock.
- What is synchronization? Explain the conditions to be followed to achieve synchronization.
- What is process? Explain with the help of process transition diagram.
- What do you mean by IPC?

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

Q. 3. a. Explain the following:

- Context switching
 - System calls
 - Throughput
 - Dispatcher
 - Scheduling queue
- b. Consider 4 jobs arriving in the ready queue in the same time i.e. 1. If the burst time requirement of these processes are 5,7,3,2. What is the completion time for the 3rd process? Assuming the shortest job first scheduling algorithm is used.

- Q. 4.** a. Using SRTF & LRTF scheduling technique calculates the average Turn Around Time & average Waiting Time for the following processes.

PROCESS	ARRIVAL TIME	BURST TIME
1	2	8
2	7	1
3	6	2
4	3	6
5	5	9

- b. Consider a system with main memory access time is 100 ns and TLB access time is 20 ns and TLB hit Ratio is 95% then calculate EMAT with TLB and without TLB.

- Q. 5.** a. Consider a system with LAS & PAS equal to 2^{16} Bytes. The memory is byte addressable. The page size is 512 bytes & page table entry size is 2 bytes. The page table entry store beside other information use 4 bytes. How many bytes are still available in the page table?
- b. Explain the storage placement strategies in details with taken only one example for all storage placement strategies (In example minimum 4 process (request) & minimum 4 partition must be required).

- Q. 6.** a. Consider the following page reference string:

2,2,3,4,2,1,5,6,2,1,3,7,6,3,2,1,2,3,6

How many page faults would occur for the algorithm LRU using three frames?

- b. What do you mean by Deadlock? Use of Banker's algorithm consider a system with four processes P_0 to P_3 and three resource types **A**, **B** and **C**. Resource type **A** has seven instances, resource type **B** has nine instances, and resources type **C** has ten instances. Suppose that at time T_0 the following snapshot of the system has been taken:

	MAX			ALLOCATION			AVAILABLE		
	A	B	C	A	B	C	A	B	C
P_0	6	5	4	0	3	4	4	3	1
P_1	3	4	2	2	1	2			
P_2	1	0	4	0	0	2			
P_3	3	2	5	1	2	1			

Check that the system is currently in a safe state or not if we use this safe sequence: $P_1 P_3 P_0 P_2$. If this sequence is not a safe sequence then find a safe sequence for above snapshot.

- Q. 7.** a. What do you mean by MVT & MFT? Explain with example.
- b. In disk scheduling algorithm, following is the track requests:

98, 183, 37, 122, 14, 124, 65, 67

Compute the seek time using C-LOOK disk scheduling algorithm if the r/w head presently is on 43.

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END SEMESTER EXAMINATIONS, JULY-2018**PROGRAM : BCA****THIRD SEMESTER****COURSE CODE : BCA202****COURSE TITLE : DISCRETE MATHEMATICAL STRUCTURES****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. How many sub sets can be formed from a set of n elements.
- b. Consider the sets $A = \{a, b, c\}$ and $B = \{5, 6, 7, 8\}$. Find Cartesian product of sets A and B .
- c. Let P, Q and R be three finite sets. Then $|P \cap Q \cap R| = \dots\dots\dots$
- d. Determine the value of $\lfloor -13 \rfloor$ and $\lceil 3.143 \rceil$.
- e. The sum of degrees of all the vertices in a graph is always odd. (True/False)
- f. Let A be a set given by $A = \{1, 2, 3\}$. Then how many relations can be there from A to A .
- g. Write the converse of the following statement: If it is hot, then I take cold drinks.
- h. What is a pendent edge?
- i. Consider the set $A = \{-1, 0, 1\}$. Check whether A is closed under multiplication.
- j. There are 12 persons called on an interview. Each one is capable to be selected for the job.
How many permutations are there to select 7 persons from 12 persons?

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. Prove that: $(A \cap B)^c = A^c \cup B^c$.
- b. Define one-one and onto function. If R is the set of real numbers, then show that the function $f: R \rightarrow R$ defined by $f(x) = 5x^3 - 1$, is an invertible function.
- c. For the set of positive integers n , prove the following by mathematical induction
$$1^3 + 2^3 + 3^3 + \dots + n^3 = \left[\frac{n(n+1)}{2} \right]^2.$$
- d. Let $X = \{1, 2, 3\}$ and $f: X \rightarrow X$ be defined such that $f = \{(1, 2), (2, 1), (3, 3)\}$, then find the following
 - i. f^{-1}
 - ii. f^2
 - iii. f^3
 - iv. f^4 .
- e. Solve the recurrence relation $a_n + 6a_{n-1} + 12a_{n-2} + 8a_{n-3} = 0$.
- f. Determine whether the following statement is a tautology, contingency or a contradiction:
$$(p \rightarrow q) \leftrightarrow (\sim q \rightarrow \sim p).$$
- g. Define the followings with example
 - i. Euler path,
 - ii. Euler circuit,
 - iii. Hamiltonian path,
 - iv. Hamiltonian circuit.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

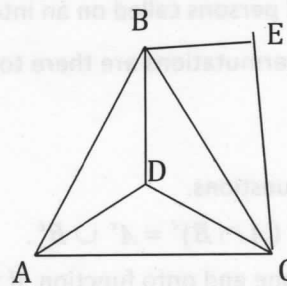
- Q. 3.**
 - a. Solve the recurrence relation $a_n - 2a_{n-1} = 7n^2$. (9)
 - b. Find the generating function for each of the following sequence (6)
 - i. 2, -2, 2, -2, ...
 - ii. 0, 0, 2, 2, 2, ...
 - iii. 3, 6, 12, 24, 48, ...

- Q. 4. a. Define a group. Show that the set of all integers is an abelian group under the operation of addition. (8)
- b. A panel has to select a president, vice president and secretary from the committee of five members namely Ankit, Arjit, Sonu, Monu and Nonu. (7)
- How many selections include Sonu and Monu?
 - How many selections are there in which either Nonu is a secretary or he is excluded?
 - How many selections are there in which Ankit is president?

- Q. 5. a. Using the following true statements, locate the treasure hidden in the estate: (8)
- If the house is next to a lake, then the treasure is not in the kitchen.
 - If the tree in front yard is a mango tree, then the treasure is in the kitchen.
 - The house is next to a lake.
 - If the tree in the backyard is an oak tree, then the treasure is in the drawing room
 - The tree in front yard is a mango tree or the treasure is placed behind the mirror in the wall of the study room.
- b. Using mathematical induction, prove that, $9^n - 2^n$ is divisible by 7, n being positive integer. (7)

- Q. 6. a. Define equivalence relation and partial order relation. Consider the relation set inclusion $\subseteq$ on a collection of sets. Check whether it is: (10)
- an equivalence relation, ii. partial order relation. (give proper explanation)

- b. i. Find the adjacency matrix of the following graph.



- ii. Draw the undirected graph represented by the following incidence matrix. (2.5 + 2.5)

$$\begin{matrix} & e_1 & e_2 & e_3 & e_4 & e_5 \\ \begin{matrix} V_1 \\ V_2 \\ V_3 \\ V_4 \end{matrix} & \begin{bmatrix} 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 \end{bmatrix} \end{matrix}$$

- Q. 7. a. If 60 fans who attended the home Formula 1 game bought up all the paraphernalia for their cars. Altogether 20 stickers, 36 car decals and 12 key chains were sold. We know that 52 fans bought at least one items and no one bought more than one of a given item. Also, 6 fans bought both decals and key chains, 9 bought both decals and stickers and 5 bought both key chains and stickers. Find that how many fans bought all the three items. Also find the number of fans who bought exactly one item. Further, fill in the correct number in every regions of the corresponding Venn diagram. (10)

- b. Let $A = \{2, 3, 4, 5\}$. Consider the relation on R defined as (5)
- $$R = \{(2, 2), (2, 3), (2, 4), (2, 5), (3, 4), (3, 5), (4, 5), (5, 3)\}.$$
- Then find $R \circ R$ using matrices.

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END SEMESTER EXAMINATIONS, JULY-2018**PROGRAM : BCA THIRD SEMESTER****COURSE CODE : BCA201****COURSE TITLE : COMPUTER ORGANIZATION AND ARCHITECTURE****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q.1.** Attempt all questions.**(2 x 10 = 20)**

- a. Explain the LRU algorithm?
- b. Define Mapping?
- c. Give the formula for Speed up?
- d. What is the demand paging?
- e. What is Page Fault?
- f. What is software interrupt?
- g. What are the various units in the computer?
- h. What is a Address bus?
- i. What is the role of Program Counter?
- j. Define Flip flop.

SECTION B**Q.2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. Consider the following page reference string:
1,2,3,4,2,1,5,6,2,1,3,7,6,3,2,1,2,3,6
How many page faults would occur for the algorithm LRU using four frames?
- b. Draw and explain the block diagram of a simple computer with five functional units.
- c. What is memory mapping technique? Define direct mapping and associative memory techniques.
- d. Explain various types of hardware interrupts.
- e. What is memory hierarchy? Explain with the help of diagram.
- f. Consider 42 bit physical address, where the size of cache memory is 4MB and the size of cache block is 128B. Compute the number of tag bits if 8-way set associate mapping is used.
- g. What are the major differences between processor and peripheral? Draw the connection of I/O bus to peripheral devices.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)**Q.3.**

- a. Define the followings.
 - i. FIFO page replacement
 - ii. Multilevel Cache
 - iii. Time Multiplexed Pins
 - iv. Register addressing Modes
- b. Consider the following page reference string:
4,5,7,12,4,5,13,4,5,7
Identify the hit ratio using FIFO and OPR using 3 frames.

- Q.4.** a. What do you mean by addressing modes? Explain various addressing modes with the help of examples.
 b. Consider an instruction pipeline which has a speedup factor 20 while operation with 70% efficiency. What would be number of stages in pipelings?

- Q.5.** a. Perform the following conversion.

i. $(11011110)_2 = (?)_{10}$

ii. $(2HAC)_{16} = (?)_8$

iii. $(1694)_{10} = (?)_2$

iv. $(1525)_6 = (?)_4$

v. $(7874)_{10} = (?)_{16}$

- b. What is virtual memory? Explain the various volatile memories in detail.

- Q.6.** a. What is memory organization? Explain with the help of diagram and also discuss about the various types of memory organization.

- b. A nonpipeline system takes 80 ns to process a task. The same tasks can be processed in a 11 stages pipeline with the clock cycle of 10 ns. Determine the speedup ratio of pipeline for the 100 task.

- Q.7.** Consider the following 4-stage instruction pipeline where different instruction are spending different amount of time at different stage. How many clock cycles are required to complete the them? Also find out the efficiency over the non pipelined system.

	S1	S2	S3	S4
I1	2	1	2	2
I2	1	3	3	1
I3	2	2	2	2
I4	1	2	1	2

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END SEMESTER EXAMINATIONS, JULY-2018**PROGRAM : BCA****THIRD SEMESTER****COURSE CODE : BCA205 COURSE TITLE : ORGANIZATIONAL BEHAVIOUR AND PERSONNEL MANAGEMENT****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****(2 x 10 = 20)****Q. 1.** Attempt all questions.

- a. What do you mean by selection?
- b. Explain the word "Perception".
- c. What is the type of recruitment needs?
- d. What do you mean by personality?
- e. What do you mean by team?
- f. Explain the term "Attitude".
- g. What are the benefits of knowledge of subject OB for IT student?
- h. Write any two characteristics of HRM.
- i. Explain the term 'perception'.
- j. Role of human resource manager.

SECTION B**(7 x 5 = 35)****Q. 2.** Attempt any 5 questions.

- a. Explain the difference between recruitment and selection.
- b. Explain the meaning of job specification and job description.
- c. What do you mean by human resource planning?
- d. What is job analysis? Explain the significance of job analysis.
- e. What do you mean by organization behaviour and its importance?
- f. What are the fourteen principles of Fayol's administrative theory of management?
- g. What is a Reference Check? Describe how it is done.

SECTION CAttempt any 3 questions.**(15 x 3 = 45)**

- Q. 3.** a. What do you mean by orientation? Discuss the steps of induction program. (7.5)
 b. Explain the recruitment process. (7.5)

- Q. 4.** a. What are the factors which influence the perception? (7.5)
 b. "Leaders are born, managers are made" comments. (7.5)

- Q. 5.** a. Does behavior always follow the attitudes? (7.5)
 b. What are the major job attitudes? (7.5)

- Q. 6.** a. Explain the nature and scope of organization behaviour. (7.5)
 b. What are the challenges and opportunities of organizational behavior? (7.5)

- Q. 7.** a. What are the external sources of recruitments? (7.5)
 b. Explain the functions of management. (7.5)

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END SEMESTER EXAMINATIONS, JULY-2018

PROGRAM : BCA THIRD SEMESTER

COURSE CODE : BCA203

COURSE TITLE : OBJECT ORIENTED PROGRAMMING USING UML & C++

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION AQ. 1. Attempt all questions.

(2 x 10 = 20)

- a. How do the properties of the following two derived classes differ?
 - (i) class X : public A { //.. }
 - (ii) class Y : private A { //.. }
- b. Explain the characteristics of static class members.
- c. Why do we need constructors?
- d. Differentiate between compile-time and run-time polymorphism.
- e. Differentiate between interaction model and state model.
- f. What do you understand by generalization and association?
- g. List out the operators which cannot be overloaded in C++.
- h. Why can't we create Object of Abstract Class?
- i. What are the various types of inheritance?
- j. What are the various types of actors in use case diagram?

SECTION BQ. 2. Attempt any 5 questions.

(7 x 5 = 35)

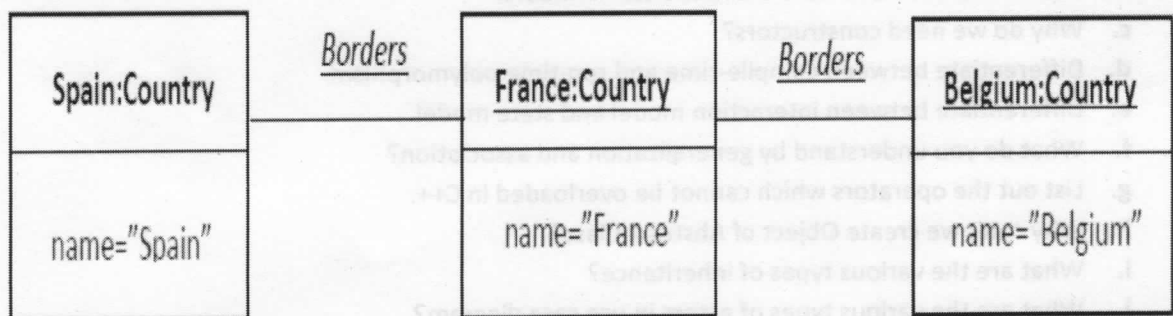
- a. Discuss the fundamental features of the object oriented programming.
- b. Write a class called "Student" with data members (char name, int rollnumber, int marks). Write appropriate inline member functions to enter and access the student data. Write a member function to calculate the average marks for a student and print it on the console.
- c. What is Inheritance? What are the rules that must be kept in mind while deciding whether to define members as private, protected, or public?
- d. Explain template. Write a program using function template to find the cube of a given integer, float and a double number.
- e. Design a sequence diagram for converting C++ program (source code having file extension .cpp) to .exe file.
- f. Design a use case diagram for SRHU library management system.
- g. Is it possible that a function is friend of two different classes? If yes, then how it is implemented in C++?

SECTION CAttempt any 3 questions.

(15 x 3 = 45)

- Q. 3.
 - a. Explain the concept of operator overloading. Write a program to overload the operator '+' for complex numbers.
 - b. Differentiate between default constructor and copy constructor using suitable example.
- Q. 4.
 - a. What is multiple inheritance? Write a program that explains how to pass parameters to the constructors of base classes in multiple inheritance.
 - b. Differentiate between abstract class and concrete class.

- Q. 5. a. Differentiate between late binding and early binding.
b. How is polymorphism achieved at run time? Explain with appropriate example.
- Q. 6. a. Write a C++ program to generate the following series: **1 2 3 5 8 13 21 34.....**
b. Why is a destructor function required in class? Can a destructor accept argument?
- Q. 7. a. Differentiate between state and event. What are the various types of events? Explain with suitable examples.
b. What do you mean by class and object? Prepare a class diagram from the object diagram for a portion of Europe given below:



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END SEMESTER EXAMINATIONS, JUNE - 2018
PROGRAM : BCA FOURTH SEMESTER

COURSE CODE : BCA208**COURSE TITLE : MULTIMEDIA TECHNOLOGY AND APPLICATIONS****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.**(2 x 10 = 20)**

- a. Write one line description of all multimedia objects.
- b. Explain briefly the types of images.
- c. Define pixel and resolution.
- d. What is GPU and why we use it?
- e. Write down the functions of Adobe Photoshop.
- f. What are the features of authoring tools?
- g. Give diagrammatic representation of PCM.
- h. Define types of processors used in multimedia.(In brief)
- i. Define temporal premasking and postmasking.
- j. Explain how to determine MNR with the help of frequency curve.

SECTION B

Q. 2. Attempt any 5 questions.**(7 x 5 = 35)**

- a. Explain the terms: trimming, splicing, assembly, volume adjustments, resampling, digital equalization, time stretching.
- b. Explain JPEG modes and state 3 observations on which JPEG compression relies.
- c. Apply LZ77 encoding and decoding algorithm on ababcbababaaaaaa.
- d. Explain 4-connectivity, 8-connectivity, m-connectivity and their disadvantage, if any. How to determine connected components in image.
- e. Explain rotoscoping, keyframing, parametric and procedural techniques for animation.
- f. Explain image negative and replication technique through pixel matrix [1 2 3 ; 4 5 6 ; 7 8 9].

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)**Q. 3.** Explain below.

- a. Dithering (7.5)
- b. Virtual reality (7.5)

Q. 4. a. Explain LZW encoding and decoding. What is the problem associated with decoding and how it is solved. (6)
b. Explain component video, composite video and S-Video. Write about quantization, coding in JPEG technique. (9)

Q. 5. a. Write about GIF, JPEG, PNG, TIFF and EXIF file formats. (7.5)
b. Explain MPEG audio compression. (7.5)

Q. 6. a. Explain Lloyd max quantizer and Mu-Law quantizer. (7.5)
b. For the following sequence {1.2,-0.2,-0.5,0.4,0.89,1.3}, Quantize it using a uniform quantizer in the range of (-1.5,1.5) with 4 levels, and write the quantized sequence. Also, allocate the bits. (7.5)

Q. 7. a. What is adaptive Huffman coding? Explain. (7.5)
b. Write about analog video. Explain sequential search method of motion vectors for video compression. (7.5)

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END SEMESTER EXAMINATIONS, JUNE-2018**PROGRAM : BCA FOURTH SEMESTER****COURSE CODE : BCA207****COURSE TITLE : DATABASE MANAGEMENT SYSTEMS****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections and Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. What are non-prime attributes? Explain with the help of example.
- b. Explain count function in SQL?
- c. Define the term data and information.
- d. Differentiate between attribute and entity.
- e. Define functional dependency?
- f. Differentiate between Super key and a candidate key.
- g. What do you mean by relation?
- h. Explain alter command in SQL with example.
- i. Define Schema.
- j. What is trigger?

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. Define the term Specialization and Generalization with examples.
- b. Draw E-R diagram for college management system. List keys and relationships.
- c. What is join? Explain different type of join with different example.
- d. Define all the properties of transactions.
- e. What do you mean by serializable? Explain with example.
- f. What are the various characteristics of SQL? Discuss five aggregate functions with a suitable example.
- g. Consider the following relation R(A,B,C,D,E) and FD's $A \rightarrow BC$, $C \rightarrow A$, $D \rightarrow E$, $F \rightarrow A$, $E \rightarrow D$. Is the decomposition of R into R1(A, C, D), R2(B, C, D) AND R3(E,F,D) lossless, justify your answer.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)**Q. 3.** a. Write SQL queries for the following -**(10)**

Employee (e_id, e_name, e_city, e_sal)

- i. Add new column age to Employee.
 - ii. Retrieve all records for employee who belongs to a particular city.
 - iii. Assign value to age for each record.
 - iv. Change e_sal of all employee to 30000 if e_sal range between 25000 to 30000.
 - v. Write a query to find the e_sal citywise.
- b.** Explain relational model in detail. (5)
- Q. 4.** a. How can relations in E-R diagram be converted into attributes during conversion of E-R diagram to tables. (7.5)
- b. What do you mean by constraints in relational model? With the help of suitable example, explain all types of constraints. (7.5)
- Q. 5.** a. Define the term atomicity, consistency, isolation and durability with help of example. (7.5)
- b. What do you mean by 3NF? Explain with an example. (7.5)
- Q. 6.** a. Explain Conflict Serializability with an example? How it is different from View Serializability? (7.5)
- b. Explain the following commands insert, create, drop, update by writing their syntax. (7.5)
- Q. 7.** a. What is a concurrency control? Explain the working two-phase locking protocol. (7.5)
- b. List and discuss the six inference rule for functional dependencies. Give relevant example. (7.5)

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END SEMESTER EXAMINATION, JUNE-2018**PROGRAM : BCA FOURTH SEMESTER****COURSE CODE: BCA 210****COURSE TITLE : SOFTWARE ENGINEERING****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. Distinguish between error and failure.
- b. What are the different levels of software testing?
- c. Which standard is applicable to software industry- ISO 9001, ISO 9002, or ISO 9003?
- d. Differentiate between functional and non-functional requirements.
- e. What is regression testing?
- f. What are CASE tools?
- g. Point out three important differences between the function-oriented and the object-oriented approaches to software design.
- h. Name a few well-established object-oriented software design technique.
- i. What is SRS document? What is the use of this?
- j. What are function points?

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. Distinguish between software verification and software validation. When, during the software life cycle, are verification and validation performed? Can one be used in place of the other?
- b. Write down five important coding standards and coding guidelines used in software companies.
- c. List the important shortcoming of LOC for use as a software size metric.
- d. List the five desirable characteristics of a good Software Requirement Specification (SRS) document.
- e. Explain basic COCOMO model. How to estimate development effort and development time for organic, semi-detached, and embedded types of software development projects?
- f. What do you understand by the term system testing? What are the different kinds of system testing that are usually performed on large software products?
- g. Explain why the spiral life cycle model is considered to be a meta model.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.**
 - a. What do you mean by the term software reverse engineering? Why is it required? Explain the different activities undertaken during reverse engineering. 8
 - b. What do you mean by the term software reengineering? Why is it required? 7
- Q. 4.**
 - a. Define three metrics to measure software reliability. Do you consider these metrics entirely satisfactory to provide measure of the reliability of a system? Justify your answer. 7
 - b. Explain different levels of SEI Capability Maturity Model (CMM). 8
- Q. 5.**
 - a. What are the main shortcomings of Data Flow Diagram (DFD) as a tool for performing structured analysis? 8
 - b. Differentiate between structured analysis and structured design in the context of function-oriented design. 7
- Q. 6.**
 - a. What is cohesion? Explain the different types of cohesion that a module might exhibit. 8
 - b. What is coupling? Enumerate the different types of coupling that might exist between two modules. 7
- Q. 7.** Identify the types of defects that you would be able to detect during the following:
 - a. Code inspection 7
 - b. Code walk-through 8

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END SEMESTER EXAMINATION, JUNE-2018**PROGRAM : BCA FOURTH SEMESTER****COURSE CODE: BCA 210****COURSE TITLE : SOFTWARE ENGINEERING****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. Distinguish between error and failure.
- b. What are the different levels of software testing?
- c. Which standard is applicable to software industry- ISO 9001, ISO 9002, or ISO 9003?
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- e. What is regression testing?
- f. What are CASE tools?
- g. Point out three important differences between the function-oriented and the object-oriented approaches to software design.
- h. Name a few well-established object-oriented software design technique.
- i. What is SRS document? What is the use of this?
- j. What are function points?

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. Distinguish between software verification and software validation. When, during the software life cycle, are verification and validation performed? Can one be used in place of the other?
- b. Write down five important coding standards and coding guidelines used in software companies.
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SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.**
 - a. What do you mean by the term software reverse engineering? Why is it required? Explain the different activities undertaken during reverse engineering. 8
 - b. What do you mean by the term software reengineering? Why is it required? 7
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 - a. What is cohesion? Explain the different types of cohesion that a module might exhibit. 8
 - b. What is coupling? Enumerate the different types of coupling that might exist between two modules. 7
- Q. 7.** Identify the types of defects that you would be able to detect during the following:
 - a. Code inspection 7
 - b. Code walk-through 8

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END SEMESTER EXAMINATIONS, JUNE - 2018**PROGRAM : BCA****FOURTH SEMESTER****COURSE CODE : BCA209****COURSE TITLE : PROGRAMMING IN JAVA****[Time allotted: Three hours]****[Max. Marks : 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. What will be the result of compiling and running the given program?

```

public class x extends y
{
    public static int test(int i)
    { return 100; }
    public static void main(String[] args)
    {
        y c = new x();
        System.out.println(c.test(10));
    }
}
class y
{
    public static int test(int i)
    { return 5; }
}

```

- b. What will happen when you attempt to compile and run the following code, Give Reason

```

class Background extends Thread{
    boolean i ;
    public int run(){
        while (i) {
            i++;
            System.out.println("i="+i);
        }
        return 1;
    }
}

```

- c. Define JVM?
- d. Define abstract class with example.
- e. Why Java is called portable language
- f. How do we define constant in JAVA?
- g. Differentiate between Multithreading and Multiprocessing?
- h. What is a role of finally in JAVA?
- i. Why Java does not support pointers?
- j. Differentiate between Java and C++.

SECTION B

(7 x 5 = 35)

Q. 2. Attempt any 5 questions.

- a. What do you mean by Package? How do we implement it in java?
- b. What is servlet and its functionality over CGI?
- c. Why we need adapter classes and how it is different from interfaces, give example.
- d. Explain concepts of inheritance in JAVA with example
- e. Discuss briefly on wrapper classes with examples.
- f. Write a program to draw the line, rectangle, oval, text using the graphics method, all the shapes should be filled with different colors?
- g. Write a program to print prime numbers between 1 to 100 by using user defined prime method.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.** a. Define Synchronization? Write a program to implement synchronized method in JAVA. (8)
b. Discuss object oriented concepts with example. (7)
- Q. 4.** a. What do you mean by Copy Constructors? Write a program to overload it. (7)
b. Discuss input/output stream classes with examples. (8)
- Q. 5.** a. Explain the concept of JSP with its elements. (9)
b. Write a program to print "welcome to the SRHU" through applet. (6)
- Q. 6.** a. Discuss Inter-thread communication and its implementation in JAVA. (7)
b. What is Border Layout? Write a program to demonstrate it. (8)
- Q. 7.** a. What do you mean by JAVA API? How do we create collection of abstract classes and interface in it? (9)
b. Write a program to read content from a file and write it onto the monitor. (6)

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END SEMESTER EXAMINATIONS, JUNE - 2018
PROGRAM: BCA FOURTH SEMESTER

COURSE CODE : BCA206 COURSE TITLE : COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

- Q. 1.** Attempt all parts of this question. (2×10 = 20)
- Define Inherent error. Also calculate absolute, relative and percentage errors if $\pi = 22/7$ is approximated as 3.14.
 - Define algebraic and transcendental equation with suitable examples.
 - Write an algorithm of iteration method of solving a non-linear algebraic equation.
 - Show that $\nabla = E^{-1}\Delta$.
 - Find the value of $(1 - \nabla)(1 + \Delta)$ in terms of shift operator.
 - As soon as new value of a variable is found by iteration, it is used immediately in the following equations, this method is called.
 - Define the rate of convergence of Newton-Raphson method.
 - Write the normal equations for fitting a curve of the type $y = a/x + b\sqrt{x}$.
 - Newton's forward interpolation formula is used for.
 - To apply Simpson's three by eight rule, the number of intervals must be multiple of.

SECTION B

- Q. 2.** Attempt any 5 parts of this questions. (7×5 = 35)

- Find a real root of the equation $2x - \log_{10} x = 7$, correct to four decimal place by iterative method.
- Find the missing term in the table:

x	15-19	20-24	25-29	30-34	35-39	40-44
y	7	21	35	?	57	58

- Find the values of x for $y = 13.5$ and at $y = 13.6$ from the following data:

x	93	96.2	100	104.2	108.7	110.25
y	11.38	12.80	14.70	17.07	19.91	21.96

by Lagrange's interpolation formula.

- Find the solution of initial value problem $dy/dx = x + \sqrt{y}$, $y(0) = 1$, for the range $0 \leq x \leq 0.6$ in steps of 0.2, correct to 4 decimal places, using Milne's method.
- Evaluate $\int_0^1 \frac{dx}{1+x^2}$ correct up to 5 decimal places by using Trapezoidal and Simpson's 1/3rd rules. Hence compare your result with exact solution.
- Find the curve of best fit of the type $y = a/x + b\sqrt{x}$ to the following data by the method of least squares:

x	93	96	100	104	108	110
y	11.38	12.80	14.70	17.07	19.91	21.96

- Calculate $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 5$ for the following data:

x	1	3	5	7	9	11
y	7	21	35	42	57	58

SECTION C

Attempt any 3 questions.

(15×3 = 45)

- Q. 3. a.** Derive a Newton-Raphson iterative formula to obtain square root of an integer. (8)

Hence compute $\sqrt{30}$ correct upto three decimal places

- b.** Given the solution of a problem as $x_a = 35.25$ with the relative error in the solution at most 2%. (7)

Find, to four decimal digits, the range of values within which the exact value of the solution must lie.

- Q. 4. a.** Apply Gauss-elimination method to solve the system of linear equations: (8)

$$x + y - 2z = 3, \quad 2x - y + z = 0, \quad 3x + y - z = 8.$$

Hence use iterative refinement process to achieve four digits precision.

- b.** Show that $hD = -\log(1 - \nabla) = \sinh^{-1}(\mu\delta)$, where symbols have their usual meanings. (7)

- Q. 5. a.** Solve the system of differential equations $dy/dx = 1 + xz$, $dz/dx = xz$, $y(0.3) = 0$, (8)

using fourth order Runge-Kutta method with step length 0.1.

- b.** Using suitable Newton's interpolation formula, find the value of y at $x = 1.85$ and at $x = 2.4$ (7)

from the following data:

x	1.7	1.8	2.0	2.1	2.2	2.3
y	5.474	6.050	6.686	7.389	8.166	9.025

- Q. 6. a.** What do you mean by ill-conditioned system? Explain with suitable example. (8)

- b.** Show that $\Delta^n[x^n] = n!$ and $\Delta^{n+1}[x^n] = 0$. (7)

- Q. 7. a.** Using Simpson's $\frac{3}{8}$ th rule, compute $I = \int_0^1 x = \frac{x^p}{x^3 + 10} dx$ for $p = 0$ and $p = 1$. (8)

- b.** Show that bisection method has linear convergence. (7)

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END SEMESTER EXAMINATIONS, JULY-2018**PROGRAM : BCA****FIFTH SEMESTER****COURSE CODE : BCA309****COURSE TITLE : DISASTER MANAGEMENT****[Time allotted: Two hours]****[Max. Marks: 50]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(1 x 10 = 10)**

- a. Two examples of biological disaster are.....and.....
- b. Full form of NSS and NCC
- c. Write two examples of structural mitigation measures.
- d. Drought comes under the Ministry of
- e. Full form of NDMA is.....
- f. Disaster Management Act was enacted in year.....
- g. What is Dicken's formula for calculating of discharge? In which part of India is it used?
- h. How you will classify the rain as light, medium and heavy rain on the basis of rainfall intensity? Give the table.
- i. What is TON? Where is it used?
- j. Give the name of gases which produces in anaerobic decomposition of sewage.

SECTION B**Q. 2.** Attempt any 4 questions.**(4 x 5 = 20)**

- a. Discuss geological disasters with example.
- b. Explain any case study of industrial disaster.
- c. "NGO plays an important role of in disaster management", Discuss.
- d. Coastal belt plantation is very effective measure to minimize disaster impact", Explain.
- e. Draw the typical figure of tipping bucket rain gauge & weighing type rain gauge?
- f. What is difference between sedimentation & disinfection? How coagulation is different from plain sedimentation? Give examples of some coagulation?

SECTION C

Attempt any 2 questions.

(10 x 2 = 20)

- Q. 3.**
 - a. Discuss the role of Indian Armed Forces in disaster management.
 - b. What are the main causes of drought? Discuss the distribution pattern of drought in India.
- Q. 4.**
 - a. Define term vulnerability. Discuss the different factors that affect vulnerability.
 - b. What are three different types of precipitation? What are the reasons behind them?
- Q. 5.**
 - a. 5 rain gauges were setup in a zone of 12000 Sq km area, the measurement of rainfall in rain gauges were 13, 12, 14, 13.5 & 12.5 cm, what will be the volume of water collected from this zone (as per avg. precipitation method) if losses in infiltration, percolation, storage & other are 10%?
 - b. In a North India city, heavy rainfall occurs, due to which discharge passes, which formula (Ryve's or Dicken's) will you use to calculate discharge? Calculate the discharge if area is 40000 Sq km and constants (C) is equal to 15.

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END SEMESTER EXAMINATIONS, JULY-2018

PROGRAM : BCA

FIFTH SEMESTER

COURSE CODE : BCA305

COURSE TITLE : WEB TECHNOLOGY

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

- What is <p>?
- What is <H4>
- What is
.
- What is <DIV>.
- What is <TITLE>
- What is <body style="background-color:powderblue;">
- What is <p style="color:red;">This is a paragraph.</p>
- What is document.getElementById("demo").innerHTML = "Hello JavaScript!";
- What is <meta charset="UTF-8">
- What is https?

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- Explain CSS padding with the help of an example.
- Explain CSS color in RGB, HEX and HSL format with the help of an example.
- Explain Java Script function scope with the help of an example.
- Explain various Java Script date formats.
- Write a code snippet for explaining Java Script array.
- Explain Java Script switches and its use with the help of an example.
- What are Java Script bitwise operators? Explain with the help of examples.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

Q. 3. a. Explain Ruby on Rails MVC model.

(7.5)

b. What is Ruby on Rails directory structure? Explain.

(7.5)

Q. 4. a. What is active record in Rails? Explain.

(7.5)

b. Explain PHP superglobals with the help of an example.

(7.5)

Q. 5. a. Explain PHP string operators with the help of an example.

(7.5)

b. Explain various type of possible errors in PHP script. What is the difference between PHP include and require statement?

(7.5)

Q. 6. a. Why "php.ini" file is important?

(7.5)

b. Explain PHP sessions and its importance.

(7.5)

Q. 7. a. Explain PHP validation and sanitization.

(7.5)

b. What is AJAX and why it is useful?

(7.5)

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END SEMESTER EXAMINATIONS, JULY-2018
PROGRAM : BCA **FIFTH SEMESTER**

COURSE CODE : BCA301**COURSE TITLE : E-COMMERCE****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.

SECTION A

Q.1. Attempt all questions.**(2 x 10 = 20)**

- a. What is VPN?
- b. What are the goals of market research?
- c. List any two applications of B2C e-commerce.
- d. What do you mean by electronic fund transfer?
- e. What is WAP protocol stack/suite?
- f. Explain B2B model with example.
- g. Describe IP sec.
- h. Explain legal issue in e-commerce.
- i. What do you mean by digital cash?
- j. Write difference between credit card and debit card.

SECTION B

Q.2. Attempt any 5 questions.**(7 x 5 = 35)**

- a. What is e-shopping? What are the advantages and disadvantages of e-shopping?
- b. What is Digital Signature? How is an e-document signed by sender and sent to a receiver?
- c. How is security managed in ecommerce? Differentiate between physical & logical security.
- d. Explain the process of manual credit card transaction.
- e. Explain B2C e-commerce of a customer reserving airline tickets from home or workplace.
- f. What do you mean by integrity of a message? Explain with an example.
- g. Compare and contrast electronic data interchange with electronic mail.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q.3.**
 - a. What do you understand by e-governance? Give an example of G2C e-governance. **(07)**
 - b. How is paper based purchasing is different from EDI based purchasing? Explain in detail. **(08)**
- Q.4.**
 - a. Discuss various e-marketing strategies in detail. **(07)**
 - b. Explain the method of transaction processing. How can a merchant minimize the incident of internet fraud? **(08)**
- Q.5.**
 - a. Define m-commerce. How it is different from e-commerce. List various applications of m-commerce. **(07)**
 - b. Write about the security services that are to be offered in E-Payment systems. Discuss any three e-payment systems in detail. **(08)**
- Q.6.**
 - a. What do you understand by VPN? How does it maintain the confidentiality of resource from existing physical network to a selected group of nodes within the same network? **(07)**
 - b. What is WAP? Explain the architecture of WAP in detail. **(08)**
- Q.7.**
 - a. What do you mean by CRM? Explain the importance in enterprise. **(07)**
 - b. Explain the Diffie Hellman key exchange algorithm. In what way is it different from RSA algorithm? **(08)**

217

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END SEMESTER EXAMINATIONS, JULY-2018

PROGRAM : BCA

FIFTH SEMESTER

COURSE CODE : BCA102

COURSE TITLE : DIGITAL ELECTRONICS

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

- Subtract $1010100 - 1011011$ using 2's complement.
- Simplify $ABC + \bar{A}B + ABC + AB$ to minimum number of terms.
- Implement $xyz + \bar{x}y + xy\bar{z}$ using AND & OR gates.
- Write the truth table for NAND gate for two inputs.
- Simplify $F(x,y,z) = \sum(3,5,6,7)$ using three-variable K-Map.
- Give the definition of combinational circuits.
- Briefly explain 1X2 DEMUX.
- Mention the types of clocks used in sequential circuits.
- What is the difference between register and counter?
- What do you understand by the propagation delay of a flip flop?

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

a. Perform the following conversions :

(7)

- $(2341)_5$ to $()_{10}$
- $(62.25)_{10}$ to $()_2$
- $(BE)_{16}$ to $()_8$
- $(523)_6$ to $()_{10}$
- What is the result of $1001 - 101010$?

b. Answer the following:

- Find the complement of $F = wx + yz$. (2)
- Show that $F\bar{F} = 0$ and $F + \bar{F} = 1$ (where $F = wx + yz$) (3)
- Write the expression $Y = AB + BC + CA$ in the canonical form. (2)

c. Answer the following:

- Using the K-Map Method, obtain the minimal sum of product expression of the following function: $F(A, B, C, D) = \sum m(0,2,3,6,7,8,10,11,12,15)$. (4)
- Draw the truth table for $Y = A(\bar{B} + \bar{C})$ (3)

d. Answer the following:

- Implement full adder using 3X8 decoder. (4)
- Explain the operation of a 4-bit binary adder. (3)

e. Design a 4-bit binary to gray code converter. Draw its logic diagram. (7)

f. What is a carry propagation in full adder? How it can be avoid in binary adder? (7)

g. Explain the classification of logic circuits.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

Q. 3. a. Simplify the following expression:-

(7)

$$\text{Prove that } (\bar{A} + \bar{B} + \bar{D})(\bar{A} + B + \bar{D})(B + C + D)(A + \bar{C})(A + \bar{C} + D) = \bar{A}.\bar{C}.D + A.C.\bar{D} + B.C.\bar{D}$$

b. Explain any 4 logic gates writing their truth table. Draw the circuits using switch for each logic gate. (8)

Q. 4. a. With the use of maps, find the simplest SOP form of the function $F = f * g$, where

(7)

$$f = ab\bar{c} + \bar{c}d + \bar{a}c\bar{d} \text{ and } g = (\bar{b} + \bar{c} + d)(\bar{a} + c + \bar{d})$$

b. Explain in detail the error correcting and detecting codes with examples. (8)

Q. 5. a. i. Implement 16X1 MUX using 2X1 MUX.

ii. Implement 3X8 decoder using 2X4 decoder. (8)

b. What are the hazards in combinational circuits? Explain the types of hazards. With the help of an example explain how can a hazard in a combinational circuit be avoided. (7)

Q. 6. a. i. What is a sequential circuit? Explain the types of sequential circuits with examples.

ii. Design a Mod-3 counter. (7)

b. Design a sequence detector with a sequence 1100. Draw its logic diagram. (8)

Q. 7. a. Design a combinational circuit that gives a binary output equal to the squares of binary numbers 0 to 9. (8)

b. Explain DeMorgan's theorem and verify it by using truth table. (7)

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END SEMESTER EXAMINATIONS, JULY-2018

PROGRAM : BCA

FIFTH SEMESTER

COURSE CODE : BCA304

COURSE TITLE : OPTIMIZATION TECHNIQUES

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions. *Only non-programmable calculators are allowed.*SECTION A

Q. 1. Attempt all parts of this question.

(2×10 = 20)

- a. In graphical solution of solving Linear Programming problem to convert inequalities into equations, we use:
 - (i) Slack variables,
 - (ii) Surplus variables,
 - (iii) Artificial surplus variables,
 - (iv) None of these
- b. Whenever a problem has more than one optimal BF solution, then at least _____ of the non-basic variables has a coefficient zero in the zeroth row of final solution table.
- c. By applying Big M or two-phase method for solution of LPP, if in the final solution, there exists at least one variable greater than zero, then the solution is infeasible.
- d. If the value of the game is zero, then the game is known as..... game.
- e. When the principle of dominance is applicable to the payoff matrix of the given game then:
 - (i) Least element of the column $\geq$ Highest element of another column
 - (ii) Least element of the column $\leq$ Highest element of another column
 - (iii) Every element of a column $\geq$ corresponding element of another column
 - (iv) Every element of the column $\leq$ corresponding element of another column
- f. The system of loading and unloading of goods usually follows:
 - (i) LIFO
 - (ii) FIFO
 - (iii) SIOBO
 - (iv) SBP
- g. Transportation model is called.....when the total allocations in a transportation model of $m \times n$ size is not equal to $m + n - 1$.
- h. In an assignment problem given matrix is always amatrix.
- i. The following is one of the assumptions made while sequencing 'n' jobs on 2 machines
 - (i) Two jobs must be loaded at a time on any machine,
 - (ii) Jobs are to be done alternatively on each machine,
 - (iii) The order of completing the jobs has high significance,
 - (iv) Each job once started on a machine is to be performed up to completion on that machine.
- j. One of the important basic objectives of Inventory management is:
 - (i) To calculate EOQ for all materials in the organization,
 - (ii) To go in person to the market and purchase the materials,
 - (iii) To employ the available capital efficiently so as to yield maximum results,
 - (iv) Once materials are issued to the departments, personally check how they are used.

SECTION B

Q. 2. Attempt any 5 parts of this questions.

(7×5 = 35)

- a. Using Vogel's Approximation Method, find the initial basic feasible solution of the following transportation problem and also find its optimal solution.

	P	Q	R	Supply
A	10	9	8	8
B	10	7	10	7
C	11	9	7	9
D	12	14	10	4
Demand	10	10	8	

- b. Five men are available to do five different jobs. From past records, the time (in hrs.) that each man takes to do each job is known and given in the following table.

JOB→ MAN ↓	A	B	C	D	E
John	2	9	2	7	1
Prince	6	8	7	6	1
Sohan	4	6	5	3	1
Salim	4	2	7	3	1
David	5	3	9	5	1

Find the assignment of men to jobs that will minimize the total time taken.

- c. A manufacturing company purchases 10,000 parts of a machine for its annual requirements, ordering one month usage at a time. The ordering cost per order is Rs. 10 and the carrying charges are 15% of the average inventory cost Rs. 20 per part per year. The company is considering the possibility of allowing the shortage to occur and has estimated that the annual cost of shortage will be 25% of average inventory cost. Determine:
- Economic lot size,
 - The number of orders per year,
 - The time between orders, and
 - The total cost per year.
- d. The labor contract between management of Proctor and Gamble Pvt. Ltd. and the union will terminate in the near future. A new contract must be negotiated preferably before the old one expire. Apply principle of dominance, find the optimal mixed strategies for the company & union based on the given payoff matrix. Also find the value of the contract.

		Union's Strategies			
		I	II	III	IV
Company's Strategies	I	20	15	12	35
	II	25	14	8	10
	III	40	2	19	5
	IV	5	2	11	0

- e. Mr. Sumit Arora owns and manages a chili-dog and soft-drink stand near the Swami Rama Himalayan University campus. While Mr. Sumit can service 30 customers per hour on the average (μ), he gets only 20 customers per hour (λ). Because Sumit could wait on 50% more customers than actually visit his stand, it doesn't make sense to him that he should have any waiting lines. Glen hires you to examine the situation and to determine some characteristics of his queue. Calculate the following operating characteristics of the service system.
- The average utilization of the food stand
 - The average number of customer in the system
 - The average number of customer waiting in line
 - The average time a customer spends in the system
 - The average time a customer spends waiting in line
 - The probability that waiting time in the system is greater than 5 hours in the system?
 - The probability of having more than 8 customer in the system?
- f. A manufacturer of sails for small boats has a group of custom sails awaiting the last two processing operations before the sails are sent to the customers. Operation 1 must be performed before operation 2, and the jobs have different time requirements for each operation. The hours required are as follows:

Operations	Jobs									
	A	B	C	D	E	F	G	H	I	J
Operation 1	1	5	8	3	9	4	7	2	4	9
Operation 2	8	3	1	2	8	6	7	2	4	1

Find the optimal sequence that minimizes the total elapsed time T. Also calculate the total idle time of the two operations in this period.

- g. On the basis of company history, Build-Rite's management has determined the estimates of optimistic time (t_0), most likely time (t_m) and pessimistic time (t_p) of different activities of a project.

Activity	Optimistic Time (t_0)	Most likely Time (t_m)	Pessimistic Time (t_p)
1-2	4	8	12
2-3	1	4	7
3-4	8	12	16
3-5	3	5	7
4-5	0	0	0
4-6	3	6	9
5-7	3	6	9
5-8	4	8	6
6-10	4	6	8
7-9	4	8	12
8-9	2	5	8
9-10	4	10	16

- (i) Draw the network diagram for the project.
(ii) Find the expected duration & variance of each activity.
(iii) Identify the critical path and expected project completion time.

SECTION C

Attempt **any 3** questions.

(15×3 = 45)

- Q. 3. a. Use Two-Phase Simplex method to solve the following LPP:

(10)

$$\text{Minimization } z = 4x_1 + 2x_2$$

Subject to:

$$3x_1 + x_2 \geq 27$$

$$x_1 + x_2 \geq 21$$

$$\text{and } x_1 \geq 0, x_2 \geq 0$$

- b. Solve the following game using saddle point to obtain the optimal strategy of for the two players A and B, also compute the value of game, given the pay-off matrix of the player A:

(5)

		Player B				
		I	II	III	IV	V
Player A	I	9	12	7	14	26
	II	25	35	20	28	30
	III	7	6	-8	3	2
	IV	8	11	13	-2	1

- Q. 4. a. Solve by using Big-M method, the following LPP

(10)

$$\text{Maximize } z = 6x_1 + 4x_2$$

Subject to

$$2x_1 + 3x_2 \leq 30$$

$$3x_1 + 2x_2 \leq 24$$

$$x_1 + x_2 \geq 3$$

$$\text{and } x_1 \geq 0, x_2 \geq 0$$

- b. Explain the processing of 2-jobs through m -machines. Define the graphical method to minimize the time added to process the jobs on machine.

(5)

- Q. 5. a. Solve the following game graphically to obtain the optimal strategy of for the two players A and B, also compute the value of game, given the pay-off matrix of the player A: (10)

		Player B				
		I	II	III	IV	V
Player A	I	0	5	6	-2	3
	II	2	3	2	4	1
	III	-3	1	4	-5	2

- b. What is an assignment problem? Describe Hungarian method to solve the problem. (5)

- Q. 6. a. A machine operator has to perform three operations, namely plane turning, step turning and taper turning on a number of different jobs. The time required to perform these operations in minutes for each operating for each job is given in the matrix given below. (10)

Jobs	I	II	III	IV	V	VI
Plane Turning	3	12	5	2	9	11
Step Turning	8	6	4	6	3	1
Taper Turning	13	14	9	12	8	13

Find the optimal sequence that minimum the total elapsed time required to complete the jobs. Also calculate the total idle time for the machines in this period.

- b. Construct the dual of given LPP model (primal)

$$\text{Maximize } z = 6x_1 + 5x_2 + 3x_3$$

$$\text{Subject to } x_1 - 3x_2 + 4x_3 = 15$$

$$x_1 - 2x_2 + 6x_3 \leq 30$$

$$4x_1 + 2x_2 - x_3 \geq 40$$

$$\text{and } x_1 \geq 0, x_2 \geq 0, x_3 \text{ unrestricted in sign}$$

(5)

- Q. 7. a. SRHU has planned to start primary health care center (PHCC) in Toli village, District Pauri Garhwal, the Birth place of H.H. Dr. Swami Rama. The following list of activity has been finalized for timely completion of this project. (10)

Activity	A	B	C	D	E	F	G	H	I	J	K
Activity Description	Select administrative and medical staff.	Select site and do site survey	Select equipment	Prepare final construction plans and layout	Bring utilities to the site.	Interview applicants and fill positions in nursing support staff, maintenance, and security.	Purchase and take delivery of equipment	Construct the hospital	Develop an information system.	Install the equipment	Train nurses and support staff
Immediate Predecessors	-	-	A	B	B	A	C	D	A	E,G,H	F,I, J
Estimated Duration (weeks)	12	9	10	10	24	10	35	40	15	4	9

(i) Construct the project network for PHC project

(ii) Develop the project schedule (EST, EFT, LST, LFT)

(iii) Find the critical path and maximum time for completion of project

(iv) Compute total floats and free floats for critical and non-critical activities

- b. Define Queueing system and explain Kendall's notion (A/B/C): (D/E) for queueing model

(5)

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END SEMESTER EXAMINATIONS, JULY-2018**PROGRAM : BCA****FIFTH SEMESTER****COURSE CODE : BCA303****COURSE TITLE : MANAGEMENT INFORMATION SYSTEMS****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. Differentiate between data and information.
- b. What are the differences between logical view and physical view of MIS?
- c. What is KBES?
- d. List the characteristics of information.
- e. Define business model.
- f. Discuss the characteristics of a data warehouse.
- g. What are the attributes of an ES?
- h. Distinguish between intranet and extranet.
- i. List application of MIS in Services Sector.
- j. Define star schema.

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. What is E-business, E-commerce, E-communication and E-collaboration.
- b. Describe the characteristics of RTE and BPO.
- c. Why we need information processing?
- d. How can a DSS help make decisions? How do MIS and DSS differ?
- e. Differentiate between Bluetooth, Wi-fi and Wi-max.
- f. Discuss the pros and cons of OODBMS.
- g. Write down the characteristics of an effective planning.

SECTION C

Attempt any 3 questions.

- Q. 3.**
 - a. Explain in detail the various phases of System Development Life Cycle. Which phase in the SDLC is most important? **(8)**
 - b. What is the difference between data and information? How can we classify the information? **(7)**
- Q. 4.**
 - a. What do you understand by a data warehouse? Why the preprocessing of data has to be done before storing into the data warehouse? **(8)**
 - b. What is an ERP? Enlist the advantages and disadvantages of ERP. **(7)**
- Q. 5.** Write short notes on the following: **(3*5)**
 - i. Recurring Information
 - ii. Data cube
 - iii. Open and closed system
 - iv. Bluetooth
 - v. Business model
- Q. 6.**
 - a. What is a Transaction Processing System? List down the objectives of TPS and also discuss the Transaction Processing Cycle. **(8)**
 - b. What is a planning process? What are the different types of planning? **(7)**
- Q. 7.**
 - a. What is a GDSS system? What are the different approaches that can be used for a group to come to a decision? **(8)**
 - b. Explain the advantages of DDBMS. **(7)**

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END SEMESTER EXAMINATIONS, JUNE - 2018

PROGRAM: BCA

SIXTH SEMESTER

COURSE CODE : BCA308

COURSE TITLE : NETWORK SECURITY

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

- What is steganography?
- What is the purpose of the S-boxes in DES?
- What is the difference between Substitution Cipher and Transposition Cipher?
- What is a denial of service attack?
- Using the Vigenère cipher, encrypt the word "encryption" using the key term.
- Define rail fence cipher.
- What are the principles of security?
- Distinguish between Symmetric and Asymmetric key cryptography.
- What do you mean by MAC?
- Explain Fermat's Little Theorem.

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- Draw the X.509 certificate format. Explain each field in the certificate.
- What do you understand by attacks? What are the different types of attacks? Explain.
- Explain Euler's Phi-function giving example for each case and also find $\phi(100)$.
- Explain the Euclid's algorithm? Also find gcd (1970, 1066) using Euclid's algorithm.
- Explain the IP traffic processing model for Inbound and Outbound packets.
- Distinguish between the following with example:
 - Stream cipher and block cipher
 - Differential and linear cryptanalysis
- Encrypt the following plain text, "life is unpredictable", using Playfair and Vigenere cipher. Use "CISHSETSRHU" as a key word in both the cases.

SECTION C

Attempt any 3 questions.

(3 x 15 = 45)

- Find all the points on elliptic curve $E_{13}(1,1)$. (10)
 - What do you understand by DES? How DES works? How many rounds are there in DES? Discuss the steps in detail in each round. (5)
- What is meant by SHA? Based on the parameters (Message digest size, message size, block size, word size and steps in algorithm) compare the various versions of SHA (SHA-1, SHA-256, SHA-384, SHA512)? (5)
 - Explain the key management of public key encryption in detail. (10)
- Write short notes on the following: (3*5)
 - Triple DES
 - Transport mode ESP
 - CRT
 - Elliptic curve cryptography
 - Threats
- What do you understand by IPsec? Discuss the various protocols required for authentication and data confidentiality. Explain the header format for each.. (10)
 - Write down the Miller-Rabin algorithm and apply the same for $n=31$. (5)
- How does MD5 works? Explain the steps involved in the working of the algorithm (7)
 - What does RSA stands for? Write the RSA algorithm for encrypting a plain text. Generate the CT, if $p=7$, $q=17$, $e=5$, $d=77$ and $PT=10$. (8)

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JUNE-2018

PROGRAM : BCA

SIXTH SEMESTER

COURSE CODE : BCE313

COURSE TITLE : CLOUD COMPUTING

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections and Questions.

SECTION A

Q.1. Attempt all questions.

(2 x 10 = 20)

- a. Define HIPPA.
- b. What is EC2?
- c. Define para virtualization.
- d. Write two differences between IAAS and PAAS.
- e. What is web 2.0?
- f. Define use of SAN.
- g. Who developed Aneka? What can be done with it.
- h. Difference between simulation and emulation.
- i. Name hypervisor developed by Microsoft and write one use of it.
- j. Write the role of CSI.

SECTION B

Q.2. Attempt any 5 questions.

(7 x 5 = 35)

- a. What do you understand by regulation for cloud. Define the role of PCI-DSS.
- b. Explain in detail about hypervisors and their role in cloud computing.
- c. Why community clouds are being used? Write in detail about public cloud.
- d. Write NIST definition of cloud and explain each term in it.
- e. Write in detail about OS level virtualization.
- f. Who are the players of cloud reference model? What is their role?
- g. How to evaluate compliance within a cloud?

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q.3.
 - a. Define different types of virtualization. Which type of virtualization is hardest to achieve. Why? 8
 - b. How virtualization can itself become a victim of an cyber attack? How it can be defended? 7
- Q.4.
 - a. Explain in detail about the ways in which we can deploy a cloud. Give an example of each type. 8
 - b. How many types of services are provided by cloud? Give an example of each type. 7
- Q.5.
 - a. Define cluster and peer-to-peer computing. How is cloud computing different from grid computing? 8
 - b. What are web services? Explain SOAP & REST. 7
- Q.6.
 - a. What is WSDL and SOA? What are their roles to provide better services to user. 8
 - b. Name some of the applications of cloud computing. How does it play important role in developing tools used in social media. 7
- Q.7.
 - a. Write about top security issues in cloud. Explain three surfaces of attacks. Define OS security. 8
 - b. Write in detail about AWS. What are the services offered by it? What kind of services are provided by Google App Engine and Azure? 7

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END SEMESTER EXAMINATIONS, JUNE - 2018
PROGRAM : BCA **SIXTH SEMESTER**

COURSE CODE : BCA307**COURSE TITLE : COMPUTER GRAPHICS****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt **all** questions.**(2 x 10 = 20)**

- a. Write down any four graphics primitives.
- b. What is Phong equation?
- c. Explain what is screen resolution?
- d. What is the smallest unit of display?
- e. What is DirectX?
- f. Why flood fill algorithm is used?
- g. Explain ppi for resolution.
- h. What is a color table?
- i. What is texture in computer graphics objects?
- j. What is interactive computer graphics?

SECTION B

Q. 2. Attempt **any 5** questions.**(7 x 5 = 35)**

- a. Explain any algorithm for line clipping process in computer graphics?
- b. Explain 3D scaling matrix with the help of an example.
- c. Explain morphing in detail.
- d. What is windowing and view port? Explain in detail.
- e. Explain the advantages and disadvantages of gray scale image over rgb image.
- f. What is inside outside test by scan line method? Explain with the help of a diagram.
- g. Explain 2D composite transformation with the help of an example.

SECTION C

Attempt **any 3** questions.**(15 x 3 = 45)**

- | | | |
|--------------|---|------------|
| Q. 3. | a. Explain camera analogy and transformations. | 7.5 |
| | b. What is Affine transformation? Why is it important? | 7.5 |
| Q. 4. | a. Explain computer graphics input devices. How do these devices interact with graphical objects? | 7.5 |
| | b. What is ambient light? Explain ambient component. | 7.5 |
| Q. 5. | a. What is specular component in illumination? Explain in detail. | 7.5 |
| | b. Explain segment table in detail with the help of figures. | 7.5 |
| Q. 6. | a. Explain display file structure in detail. | 7.5 |
| | b. Explain Z-buffer algorithm for back face removal. | 7.5 |
| Q. 7. | a. In illumination what is diffusion component? Explain in detail. | 7.5 |
| | b. What is polygon? Why it is important in computer graphics? | 7.5 |

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END SEMESTER EXAMINATIONS, JUNE-2018**PROGRAM : BCA****SIXTH SEMESTER****COURSE CODE : BCA306****COURSE TITLE : CLIENT SERVER COMPUTING****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections and Questions.**SECTION A****Q. 1.** Attempt **all** questions.**(2 x 10 = 20)**

- a. List the roles of SQL language.
- b. What are the measures that should be considered when evaluating the server hardware?
- c. Specify the name of three server operating systems and four client operating systems.
- d. What are the roles of LAN and network administrator?
- e. Define the term UPS.
- f. What is X terminals?
- g. What do you mean by video conferencing training?
- h. List down the client/server topologies.
- i. Define stub.
- j. Explain the term data abstraction.

SECTION B**Q. 2.** Attempt **any 5** questions.**(7 x 5 = 35)**

- a. What is client / server computing? Discuss the characteristics of client / server computing.
- b. Briefly explain client and server communication using RPC. What are the issues in this?
- c. Discuss in detail the components that make up the client server architecture.
- d. Write short notes on: (i) Single system image (ii) FDDI
- e. Write a short note on RAID and mirrored disk. Explain the important goals of RAID technology.
- f. What is the functional difference between server operating system and network operating system?
- g. What is mainframe centric client server computing? What is reliability in client server model?

SECTION CAttempt **any 3** questions.**(15 x 3 = 45)**

- Q. 3.**
 - a. How does token ring LAN operate? What are the advantages of FDDI over a basic token ring?
 - b. Explain the role of client and server in client/server computing and also explain various services provided by client.
- Q. 4.**
 - a. Briefly described the role of following devices in client server computing environment:
(i) power protection devices (ii) surge protectors
 - b. Differentiate between network management and remote system management. What are the various network management application tools?
- Q. 5.**
 - a. Give the details of CORBA architecture along with their brief specification about the main components.
 - b. Write a note on DDE and OLE in detail.
- Q. 6.**
 - a. What do you understand by the terms availability, reliability and serviceability with reference to client server system development? Give brief description about each.
 - b. Explain the different client/server processing styles with its advantages and disadvantages with respect to application distribution.
- Q. 7.**
 - a. What do you mean by end user training and what are the main issues involved in it. Differentiate it with database administrator training.
 - b. Write and describe the popular type of data storage system.