Hall Ticket Number :										

Code: 5G121

R-15

I B.Tech. II Semester Regular & Supplementary Examinations June 2017

C Programming and Data Structures

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) How to access a variable through its pointer? Explain with proper example. 7M

   b) What is Void pointer? Write a 'C' program to demonstrate the use of Void pointer. 7M

OR

2. a) What is Dynamic Memory Allocation? Explain the functions malloc(), calloc() and free() with syntax and examples. 7M

   b) Write a 'C' program to implement pointer to pointer concept. 7M

UNIT–II

3. a) Define Union. Explain its general syntax with one example. 7M

   b) Write a 'C' program to display the Name, Rollnumber and Grade of 3 students. Create an array of structure objects. Read and display the contents of the array. 7M

OR

4. a) Write detailed notes on formatted input and output functions of files. 7M

   b) Write a 'C' program to implement Binary search technique. 7M

UNIT–III

5. a) How to represent a stack using Arrays and Linked list? Explain with proper diagrams. 7M

   b) Write a 'C' program to implement the stack operations using arrays. 7M

OR

6. a) How to convert an Infix expression into a Postfix expression, explain.
   Convert the following infix expression into postfix expression
   (X*Y)/(K*L)+M 7M

   b) Discuss in detail the various operations possible on a Queue. 7M

UNIT–IV

7. a) Write short notes on
      i) Static representation of Single Linked List.
      ii) Dynamic representation of Single Linked List. 7M

   b) How to insert a node at the beginning, middle and at the end of a single linked list? Explain with proper diagrams. 7M

OR

8. Write detailed notes on all operations on a Doubly Linked List. 14M

UNIT–V

9. a) How to represent a Binary tree using array and linked list? Explain with proper diagrams. 4M

   b) How to do searching operation on a Binary search tree? Write and explain the algorithm for it. 10M

OR

10. Write detailed notes on the following representation of a graph
    i) Set representation
    ii) Linked List representation
    iii) Matrix representation 14M

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Hall Ticket Number :										

Code: 5GC24

R-15

I B.Tech. II Semester Regular & Supplementary Examinations June 2017

Engineering Mathematics-II

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Change the order of integration in $\int_0^1 \int_0^{\sqrt{1-x^2}} y^2 dxdy$ and hence evaluate. 14M

OR

2. a) Show that the area between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$ is $\frac{16}{3}a^2$ 7M

b) evaluate $\int_0^{\frac{\pi}{2}} \int_0^{a\sin\theta} \int_0^{(a^2-r^2)/a} rdzdrd\theta$ 7M

UNIT–II

3. a) Find the Lapace transforn of $te^{-t}\sin tdt$ 7M

b) Evaluate $\int_0^{\infty} te^{-3t}\sin tdt$ 7M

OR

4. a) Using Convolution theorem, find the inverse transform of $L^{-1}\left\{\frac{1}{s(s^2+4)}\right\}$ 7M

b) Find $L^{-1}\left\{\log\frac{s+1}{s-1}\right\}$ 7M

UNIT–III

5. Using transform method solve $\frac{d^2x}{dt^2} - 2\frac{dx}{dt} + x = e^t$ with x = 2 , $\frac{dx}{dt}$ = -1 at t=0 14M

OR

6. Solve $\frac{d^2y}{dt^2} + 2\frac{dy}{dt} - 3y = \sin t, y = \frac{dy}{dt} = 0$ when t=0. 14M

UNIT–IV

7. a) Show that $\nabla^2 r^n = n(n+1)r^{n-2}$ 7M

b) Find the work done in moving a partical in the force field $\overline{F} = 3x^2\vec{i} + (2xz - y)\vec{j} + z\vec{k}$ along the Straight line from (0,0,0) to (2,1,3) 7M

OR

8. Evaluate the line integral $\int_c (x^2 + xy)dx + (x^2 + y^2)dy$ when c is the square formed by the lines $y = \pm 1$ and $x = \pm 1$ 14M

UNIT–V

9. Verify Green's theorem for $\int_c \left[(xy + y^2)dx + x^2 dy\right]$ where c is bounded by y=x and $y=x^2$ 14M

OR

10. Verify Stokes Theorem for $\overline{F} = (2x - y)\vec{i} - yz^2\vec{j} - y^2z\vec{k}$ over the upper half surface of the sphere $x^2+y^2+z^2 = 1$ bounded by it's projection on the xy- plane. 14M

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Hall Ticket Number :										

R-15

Code: 5G523-D

I B.Tech. II Semester Regular & Supplementary Examinations June 2017

Engineering Drawing-II

(Information Technology)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. A circular lamina of diameter 50 mm lies in a plane inclined at 40° to V.P. and perpendicular to H.P. Draw its front and top view. 14M

OR

2. A square lamina of 50mm side has a corner on the HP and 20mm in front of the V.P. All the sides of the squares are equally inclined to the HP and parallel to the V.P. Draw its projections. 14M

UNIT–II

3. A hexagonal prism of base side 30mm, axis height 50mm is resting on HP on one of its base corners with its base inclined at 35° to HP and parallel to VP. Draw the projections of the prism. 14M

OR

4. A pentagonal pyramid of base side 30mm, axis height 60mm is resting on HP on one of its base corners with its axis inclined at 50° to HP and parallel to VP. Draw the projections of the pyramid. 14M

UNIT–III

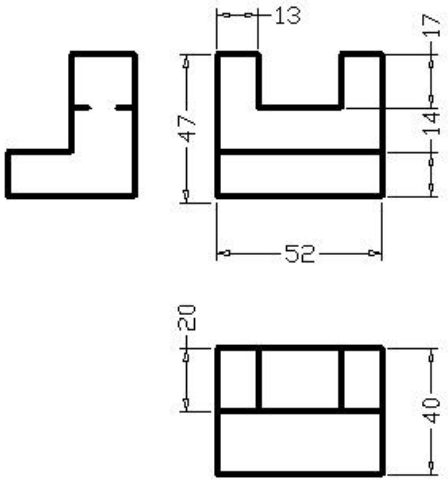
5. Draw the projections of a cone of base diameter 50mm and axis length 70 mm when it lies on the ground on one of its generators with the axis parallel to 40 mm from the VP. 14M

OR

6. A cylinder of base diameter 50mm and axis height 65mm is resting on HP on one of its generators with its axis inclined at 50º to VP. Draw its projections. 14M

UNIT–IV

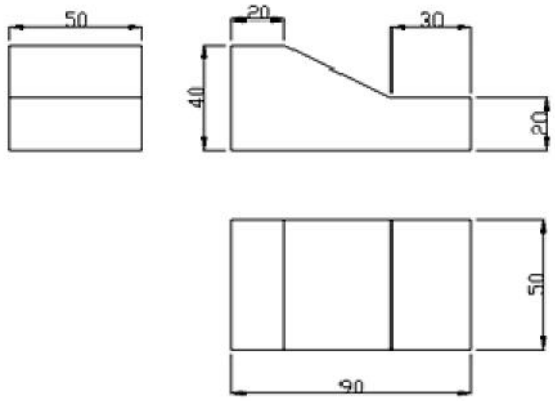
7. Draw the Isometric view of the following figure



14M

OR

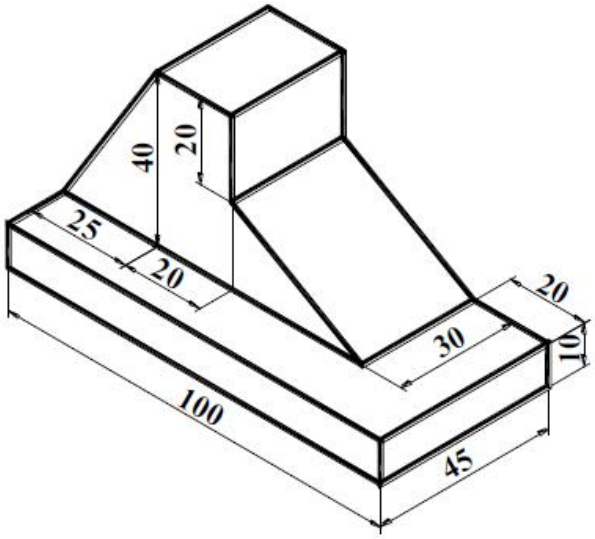
8. Draw the Isometric view of the following figure



14M

UNIT–V

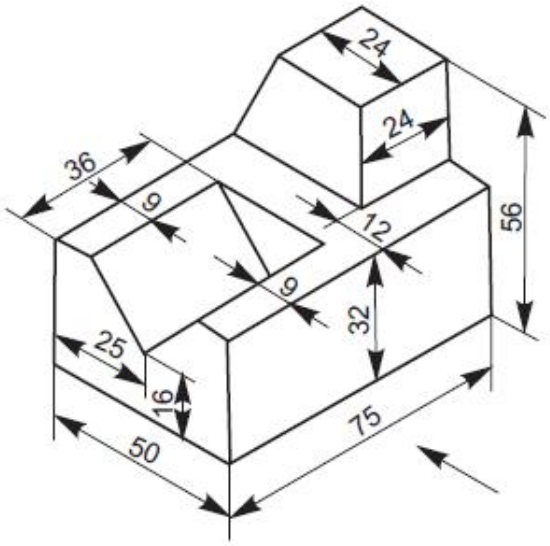
9 Draw the orthographic view of the following figure



14M

OR

10. Draw the orthographic view of the following figure



14M

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Hall Ticket Number :										

Code: 5GC23

R-15

I B.Tech. II Semester Regular & Supplementary Examinations June 2017

Engineering Physics

(Common to CE, ME, CSE and IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. Discuss about the diffraction at double slit and diffraction grating 14M

OR

2. Describe the Numerical aperture and acceptance angle. 14M

UNIT–II

3. a) State and derive Bragg's law for diffraction in crystals. How this is useful in crystal structure determination? 10M

   b) Why x-rays are preferred for crystal diffraction than visible light? 4M

OR

4. How ultrasonics are used for non-destructive testing of materials? 14M

UNIT–III

5. a) Explain the energy and wave function of an electron in potential box 10M

   b) Calculate the energy of 4^{th} state of an electron in a box of width 1nm 4M

OR

6. a) With suitable picturization of potential well and imposed boundary conditions, derive the Schrödinger equation for metallic electron and prove that energy levels are equally spaced 10M

   b) Calculate the energy and momentum of an x-ray photon whose wavelength is $2x10^{-11}m$ 4M

UNIT–IV

7. a) Explain hysteresis process in terms of domain structure of ferromagnetic materials. 8M

   b) Explain the significance of hysteresis loop and importance of hysteresis in selection of materials for different applications. 6M

OR

8. a) Describe different types of magnetic materials in terms of their spin dipole alignment and its temperature dependence. 10M

   b) Define magnetic dipole moment. List out various sources of magnetic dipole moment in magnetic materials. 4M

UNIT–V

9. a) Analyze the two main processes used for synthesis of nanomaterials 6M

   b) Discuss the synthesis of nanomaterials by ball milling method 8M

OR

10. a) Write a note on i) Penetration Depth ii) Flux quantization 10M

    b) Josephson's junction having a voltage of 8.5 μV across its terminals, and then calculate its generating electromagnetic frequency. 4M

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Hall Ticket Number :										

R-15

Code: 5GC25

I B.Tech. II Semester Regular & Supplementary Examinations June 2017

Mathematical Methods –II

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Derive the normal equations to fit the straight line $y = a + bx$ to the data points $(x_i, y_i), i = 1,2,3,.....m$ by the method of least squares. 7M

   b) Fit a straight line for the following data

x:	6	7	7	8	8	8	9	9	10
y:	5	5	4	5	4	3	4	3	3

7M

OR

2. Fit a second degree curve to the following data

x:	1	2	3	4	5
y:	10	12	8	10	14

14M

UNIT–II

3. a) Find by Taylor's series method the value of y at $x = 0.1$ and $x = 0.2$ to five places of decimals from $\frac{dy}{dx} = x^2 y - 1, y(0) = 1.$ 7M

   b) Using Runge-Kutta method of fourth order, solve $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$ with $y(0) = 1$ at $x = 0.2, 0.4$ 7M

OR

4. Using Runge-Kutta method of order 4, find y for $x = 0.1, 0.2, 0.3$, given that $\frac{dy}{dx} = x + y^2,\ y(0) = 1.$ Continue the solution at $x = 0.4$ using Milne's method. 14M

UNIT–III

5. Find the Fourier series to represent the function $f(x)$ given by

$$f(x) = x \quad for\ \ 0 \le x \le ®$$
$$= 2® - x \quad for\ \ ® \le x \le 2®.$$

Deduce that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + ... = \frac{®^2}{8}$ 14M

OR

6. Obtain Fourier cosine and sine series for $f(x) = x$ in the interval $0 \le x \le ®$.

Hence show that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + ... = \frac{®^2}{8}$ 14M

UNIT–IV

7. a) Find the Fourier transform of

$$f(x) = 1 - x^2, \quad |x| \le 1$$
$$= 0 \quad , \quad |x| > 1$$

Hence evaluate $\int_0^\infty \frac{x\cos x - \sin x}{x^3}\cos\frac{x}{2}\,dx$ 7M

b) Find the finite Fourier sine and cosine transforms of $f(x)$ defined by $f(x) = 1$, where $0 < x < ®$. 7M

OR

8. a) Find the Fourier sine transform of $e^{-|x|}$.

Hence show that $\int_0^\infty \frac{x\sin mx}{1+x^2}dx = \frac{®e^{-m}}{2}, m > 0$ 7M

b) Find the finite Fourier sine and cosine transforms of $f(x)$ defined by

$$f(x) = 1 \qquad if \quad 0 < x < \frac{®}{2}$$
$$= -1 \qquad if \quad \frac{®}{2} < x < ®$$

7M

UNIT–V

9. a) Form the partial differential equation by eliminating the arbitrary functions f and g from $z = f(x+ct) + g(x-ct)$ 7M

b) Solve by the method of separation of variables $\frac{\partial^2 z}{\partial x^2} - 2\frac{\partial z}{\partial x} + \frac{\partial z}{\partial y} = 0$ 7M

OR

10. a) Solve $(mz - ny)\frac{\partial z}{\partial x} + (nx - lz)\frac{\partial z}{\partial y} = ly - mx$ 7M

b) Solve $x^2p^2 + y^2q^2 = z^2$ 7M

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Hall Ticket Number :										

R-15

Code: 5GC21

I B.Tech. II Semester Regular & Supplementary Examinations June 2017

Technical English

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) What are the problems unsolved by technology as identified by E. F. Schumacher in his essay? 7M

   b) Define 'social time' as used by E. F. Schumacher. State its significance. 7M

OR

2 a) Mention and describe factors that cause climatic change over long periods of time. 7M

   b) Do as directed.

   i. The plan was approved by our clients. [Change the voice]

   ii. Expand the following compound nouns. 1) Driving licence 2) Car battery

   iii. But for his quickness I (be) killed. [Fill in the blank with appropriate tense form of the verb given in the bracket].

   iv. In ____problem solving message, start with the problem you share. [Use articles]

   v. Correct the following spellings. 1) mnemoncs 2) evaluvate

   vi. Choose the word that is the antonym of the underlined word.
   The man **collapsed** under the sun.
   a. stood up b. sat up c. got up d. revived e. survived

   vii. Fill in the blank using the appropriate form of the verb (gerund or infinitive) in the following sentence.
   Your English seems ---------- (improve) a lot. 7M

UNIT–II

3. a) What are the long term strategies proposed by the author to deal with climate change? 7M

   b) What is the relationship between human development and climate change? 7M

OR

4. a) Analyze the climate change with respect to temperature. 7M

   b) Read the following advertisement and draft a job application/cover letter.

WANTED MARKETING EXECUTIVE

A well-established company invites applications from competent marketing executive. Our requirements (a) University degree [B.E./B.Tech] (b) Industry experience (c) Good command over English. Please apply with full career details to the Human Resources Manager, P.O. Box 12456 7M

UNIT–III

5. a) What are the advanced and emerging solar technologies available in Spain? 7M

   b) Define photovoltaic effect. Briefly explain its operation. 7M

OR

6. a) Explain the principles of tower technology. 7M

   b) As the Personnel Manager of a Multinational firm draft an **e-mail** to be sent to those candidates who were not selected in the interview conducted few days before. 7M

UNIT–IV

7. a) State the importance and uses of water. 7M

   b) Why does Sir C.V. Raman call water as “elixir”? Explain the reasons. 7M

OR

8. a) Explain how soil erosion affects agriculture and irrigation. 7M

   b) Write a technical report on computer animation. 7M

UNIT–V

9. a) Why does Swami Vivekananda consider ignorance as mother of all evils? 7M

   b) What are the central ideas of Gita? Explain. 7M

OR

10. a) Describe the salience of the meeting between Kalam and Wernher Von Braun. 10M

    b) Vocabulary Test: Match the words in column A with their meaning in column B.

A	B
(a) carcass	(1) spreading by contact
(b) contagion	(2) dead body of an animal
(c) banish	(3) in a friendly manner
(d) amicable	(4) send away forcefully

4M

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