Hall Ticket Number :										

R-17

Code: 7G523-B

I B.Tech. II Semester Regular & Supplementary Examinations May/June 2019

Geometrical Drawing

(Common to EEE and ECE)

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. Draw a straight line AB of any length. Mark a point F, 65 mm from AB. Trace the path of a point P moving in such a way that the ratio of its distance from the point F, to its distance from AB is 3:2. Plot at least 10 points. Name the curve. Draw a normal and tangent to the curve at a point which is 45 mm from F. 14M

OR

2. A coin of 40 mm diameter rolls over horizontal table without slipping. A point on the circumference of the coin is in contact with the table surface in the beginning and after one complete revolution. Draw and name of the curve. Draw a tangent and normal at any point on the curve. 14M

UNIT–II

3. Draw the projections of a line AB, 90 mm long; its mid-point M being 40 mm above H.P and 50 mm in front of V.P. The end A is 10 mm above H.P and 20 mm in front of V.P. Determine the true inclination with the reference plane. 14M

OR

4. The distance between the end projectors of a line is 60 mm. One end is 15 mm above H.P and 50 mm in front of V.P. The other end is 60 mm above H.P and 10 mm in front of V.P. Draw the projections and find the true length of the line. 14M

UNIT–III

5. A regular hexagonal plane of 45 mm side has a corner on H.P, and its surface is inclined at 45^0 to the H.P. Draw the projections, when the diagonal through the corner, which is on the H.P, makes 30^0 with V.P. 14M

OR

6. A circle of 40 mm diameter, is resting on H.P on a point, with its surface inclined at 30^0 to H.P. Draw the projections of the circle, when the top view of the diameter, through the resting point, and makes an angle of 45^0 with *xy* line. 14M

UNIT–IV

7. Draw the projections of a square prism, side of base 30 mm and axis 60 mm long, resting with one of the edges of its base on H.P. Its axis is inclined at 30^0 to H.P and the top view of the axis at 45^0 to *xy* line. 14M

OR

8. Draw the projections of a hexagonal pyramid, with side of base 30 mm and axis 70 mm long, which is resting with a slant face on H.P such that, the axis is parallel to V.P. 14M

UNIT–V

9. Draw the orthographic views of the following Fig. 1. All dimensions are in mm.

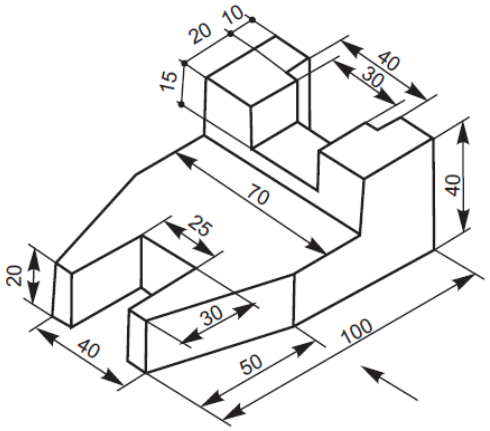

Fig. 1. 14M

OR

10. a) Draw an isometric drawing of a cone with 40 mm diameter of the base and a 55 mm long axis, when it is resting on its base. 7M

b) Draw the isometric view of a hexagonal prism, with side of base 25 mm and axis 60 mm long. The prism is resting on its base on H.P, with an edge of the base parallel to V.P. 7M

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Hall Ticket Number :										

R-17

Code: 7G121

I B.Tech. II Semester Regular & Supplementary Examinations May/June 2019

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) What is meant by a pointer? Write a program to swap the values of two variables using pointers. 7M

   b) Write a program to show the usage of pointer to structure. 7M

OR

2. a) Demonstrate the use of &(address of) and *(value at address) operators 7M

   b) Write a program to show a function returning pointer. 7M

UNIT–II

3. a) What is a structure? Explain the syntax of Structure declaration with example 7M

   b) How Selection sort is different from bubble sort? 7M

OR

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

   b) Arrange the following integers in ascending order using Merge sort procedure. 39,48,62,18,23,34,58,12. 7M

UNIT–III

5. a) Explain stack with basic Operations (push and pop). 7M

   b) Design the procedure to count number of parenthesis in an expression using Stack. 7M

OR

6. Compare Linear Queue and Circular Queue. Write a program to insert and delete from a circular queue. 14M

UNIT–IV

7. Implement Insertion, Deletion and search operations at any position in a singly linked list. 14M

OR

8. a) Write insertion and deletion functions for the doubly linked list. 7M

   b) Summarize Circular Linked List 7M

UNIT–V

9. a) Construct a Binary tree T by using the following in order and post order traversals of T.

   In order: D K I B A E G H J F C

   Post Order: K D I E A G B F C J H. 7M

   b) Explain various methods of representing graphs in memory. 7M

OR

10. What is Binary Search Tree (BST)? How do we do search in BST? Write a procedure for insertion and deletion operations on BST. 14M

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Hall Ticket Number :										

R-17

Code: 7G321

I B.Tech. II Semester Regular & Supplementary Examinations May/June 2019

Electronic Devices and Circuits

(Common to EEE & ECE)

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) Discuss biasing of BJT and its types in brief. 7M

   b) With a neat circuit diagram explain in detail about self bias of Transistor. 7M

OR

2. a) Explain the concept of thermal runaway. 7M

   b) Derive an expression for Stability for Potential Divider bias. 7M

UNIT–II

3. a) Draw the circuit symbol. Explain the construction of JFET with neat circuit. 7M

   b) Deduce the relationship among Transconductance, Drain Resistance and Amplification factor of JFET. 7M

OR

4. Differentiate between Depletion MOSFET and Enhancement MOSFET with diagrams 14M

UNIT–III

5. a) What is an amplifier? Explain how a weak signal can be amplified with a practical amplifier circuit. 7M

   b) What do you understand by DC and AC equivalent circuits of an amplifier, explain. 7M

OR

6. a) Derive expressions for Voltage gain, Current gain, Input impedance and Output impedance of a single stage CE amplifier. 10M

   b) Classify the amplifiers and explain in brief. 4M

UNIT–IV

7. a) Draw the circuit diagram of a small signal model of FET amplifier and explain. 7M

   b) With necessary diagram, derive expressions for Z_i , Z_o and $A_{v.}$ 7M

OR

8. a) With a neat circuit diagrams explain the operation of Common Source FET amplifier. 7M

   b) Compare Common Source and Common Drain FET amplifiers. 7M

UNIT–V

9. With necessary diagrams explain the tunneling phenomenon of a Tunnel Diode. Also give its applications. 14M

OR

10. a) Draw the symbol and construction of SCR and explain its operation with characteristics. 6M

    b) Write short notes on
    i) UJT ii) LED 8M

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Hall Ticket Number :										

R-17

Code: 7GC22

I B.Tech. II Semester Regular & Supplementary Examinations May/June 2019

Engineering Chemistry

(Common to EEE & ECE)

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) Explain chlorination of water and break point chlorination. 7M

   b) Calculate the permanent & temporary hardness of the water sample containing 46.5 mg/L of $Ca(HCO_3)_2$, 81.0 mg/L of $MgCl_2$, 31.5 mg/L of $MgSO_4$and 29.5 mg/L of $CaCl_2$. 7M

OR

2. a) Describe Winkler's method to determine dissolved oxygen in water. 7M

   b) What are ion exchange resins? How can the resins be recharged? 7M

UNIT–II

3. a) For the cell (Al, Al^{3+})// (Sn^{4+} Sn^{2+}), write the cell reaction, calculate the cell emf when the activities are 1.5M for all the ionic species, ΔG^0 and equilibrium constant. Also predict the feasibility of the cell reaction. Given,

   $E^0_{(Al^{3+},Al)} = -1.66V$ and $E^0_{(Sn^{4+},\ Sn^{2+})} = 0.15V$ 7M

   b) Explain Sacrificial anode and Impressed current cathodic protection in detail. Write their applications. 7M

OR

4. a) Describe the construction and chemical reactions involved in lithium ion battery. 7M

   b) Explain oxidation corrosion with mechanism and discuss about Pilling-Bedworth rule. 7M

UNIT–III

5. a) Describe the preparation, properties and engineering applications of Bakelite. 7M

   b) Write a note on thermoplastics and thermosetting plastics with examples. 7M

OR

6. a) What are silicones? Mention the characteristics and uses of silicones. Describe the synthesis of a cross linked silicone. 7M

   b) Write a brief note on Vulcanization and compounding of rubber. 7M

UNIT–IV

7. a) A gaseous fuel on analysis is found to contain 40% CH_4, 40% C_3H_8, 10% H_2, 5%O_2 & 5%N_2. Calculate the weight & volume of air required for combustion of 1m^3 of the fuel. 8M

   b) Describe the process of refining of crude oil and mention the major products with their carbon chain length. 6M

OR

8. What is HCV and LCV of a fuel? Justify the relation between them. Discuss the Bomb Calorimeter method to determine the CV of fuel. 14M

UNIT–V

9. a) Discuss the following properties of refractories: porosity, thermal spalling & dimensional stability. 7M

   b) What do mean by viscosity index and aniline point of a lubricant? How viscosity index of a lubricant can be determined? 7M

OR

10. a) What is Portland cement? Describe the manufacture of Portland cement by dry method with a neat labelled diagram of rotary kiln. 8M

    b) Mention the functions of lubricants. Discuss about hydrodynamic & thin-film lubrication mechanism. 6M

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Hall Ticket Number :										

R-17

Code: 7GC24

I B.Tech. II Semester Regular & Supplementary Examinations May/June 2019

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. Trace the curve- Folium of Descartes: $x^3 + y^3 = 3axy$. 14M

OR

2. Evaluate $\int_0^1 \int_x^{\sqrt{x}} xy\, dxdy$ by changing the order of integration. 7M

UNIT–II

3. a) Find the Laplace transform of $e^{3t}\, t^{\frac{7}{2}}$ 6M

   b) Find the Laplace transform of $\int_0^t \frac{Sin\, u}{u} du$. 8M

OR

4. Find the Laplace transform of the Half wave rectifier

$$f(t) = \begin{cases} Sin\, \omega t, & 0 < t < \frac{\pi}{\omega} \\ 0, & \frac{\pi}{\omega} < t < \frac{\pi}{2\omega} \end{cases}$$ 14M

UNIT–III

5. Use convolution theorem to evaluate $L^{-1}\left[\frac{s}{(s^2+1)^2}\right]$. 14M

OR

6. Solve the differential equation $y'' + 7y' + 10y = 4e^{-3t}, y(0) = 0, y'(0) = -1$ using Laplace Transforms. 14M

UNIT–IV

7. a) Prove that $\nabla r^n = nr^{n-2}\bar{r}$. 7M

   b) Find the directional derivative of $f = x^2yz + 4xz^2$ at (1,-2,-1) in the direction of $2\bar{\imath} - \bar{\jmath} - 2\bar{k}$. 7M

OR

8. Prove that $\bar{A} = (6xy + z^3)i + (3x^2 - z)j + (3xz^2 - y)k$ is irrotational. Find the scalar function $f(x, y, z)$ such that $\bar{A} = \nabla f$. 14M

UNIT–V

9. Verify Gauss divergence theorem for $\bar{f} = (x^3 - yz)i - 2x^2y\, j + zk$ taken over the surface of the cube bounded by the planes *x=y=z=a.* the coordinate planes. 14M

OR

10. Verify Green's theorem for $\oint_C (xy + y^2)dx + x^2dy$, where *C* is the closed curve of the region bounded by $y = x$ and $y = x^2$. 14M

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Hall Ticket Number :										

R-17

Code: 7G523-A

I B.Tech. II Semester Regular & Supplementary Examinations May/June 2019

Geometrical Drawing

(Common to EEE and ECE)

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. The foci of an ellipse are 90 mm apart and the minor axis is 65 mm long. Determine the major axis and draw half the ellipse by concentric circles method and the other half by oblong method. Draw the tangent to the ellipse at a point above the major axis. 14M

OR

2. Draw an epi-cycloid of a circle of 40 mm diameter, which rolls on another circle of 120 mm diameter for one revolution clockwise. Draw a tangent and a normal to it at a point 90 mm from the centre of the directing circle. 14M

UNIT–II

3. A line AB of 65 mm long has its end A, 25 mm above H.P and 20 mm in front of V.P. The end B is 40 mm above H.P and 50 mm in front of V.P. Draw its projections and find its inclination with H.P and V.P. 14M

OR

4. The top view of a 75 mm long line AB, measures 65 mm; while the length of its front view is 50 mm. Its one end A is in the H.P and 12 mm in front of the V.P. Draw the projections of the line AB and determine its inclination with H.P and V.P. 14M

UNIT–III

5. A square lamina ABCD of 30 mm side rests on one of its corners on the ground. Its plane is inclined at 35^0 with H.P and diagonal DB inclined at 65^0 to V.P and parallel to H.P. Draw its projections. 14M

OR

6. A thin semi-circular plate of 70 mm diameter, has its straight edge in H.P and inclined at 45^0 to V.P; while the surface of the plate is inclined at 30^0 to H.P. The end A of the diameter AB is nearer to the V.P and is at a distance 25 mm from it. Draw the projections of the plate. 14M

UNIT–IV

7. A hexagonal pyramid of side of base 25 mm and axis 60 mm long is resting on an edge of the base on H.P. Draw the projections of the solid, when the axis makes an angle of 45^0 with H.P and the base of the solid is nearer to the V.P. 14M

OR

8. Draw the projections of a cylinder of base 30 mm diameter and axis 40 mm long, which lies on H.P on a point of its rim, with its axis inclined at 30^0 to H.P. The top view of the axis is perpendicular to V.P. 14M

UNIT–V

9. Draw the orthographic views of the following Fig. 1. All dimensions are in mm.

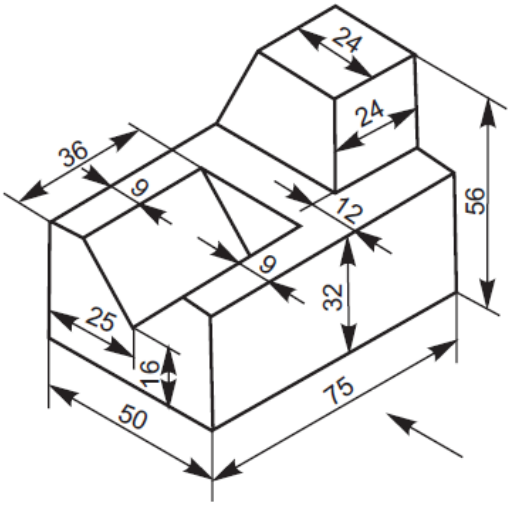

Fig. 1. 14M

OR

10. Three views of an object are shown in Fig. 2. Make an isometric drawing of the object. All dimensions are in mm.

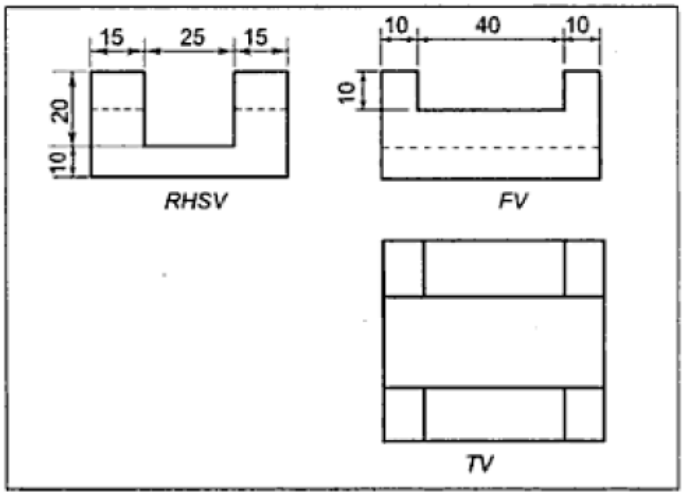

Fig. 2. 14M

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