20/6/2011

FE Sem-II
Engineering Drawing

ws Scan Paper -2 135

**Con. 3245–11.**

**RK–1113**

(3 Hours)

**[Total Marks : 75**

N.B. (1) Question No.1 is compulsory.

(2) Attempt any four questions out of remaining six questions.

(3) All dimensions in figures are in mm.

(4) Use your own judgment for any unspecified dimensions assuming suitable data if necessary.

(5) Use only first angle method of projection.

(6) Retain all construction lines.

(7) Figures to the right indicate full marks.

(8) Use both the sides of drawing sheets.

(9) Use scale 1:1 only

**1.** Figure1,shows a pictorial view of a Block. Draw the following views:-

(a) Sectional F.V. Looking along arrow X (section B-B) 4

(b) R.H.S.V 4

(C) Top View 5

Insert at least 10 major dimensions 2

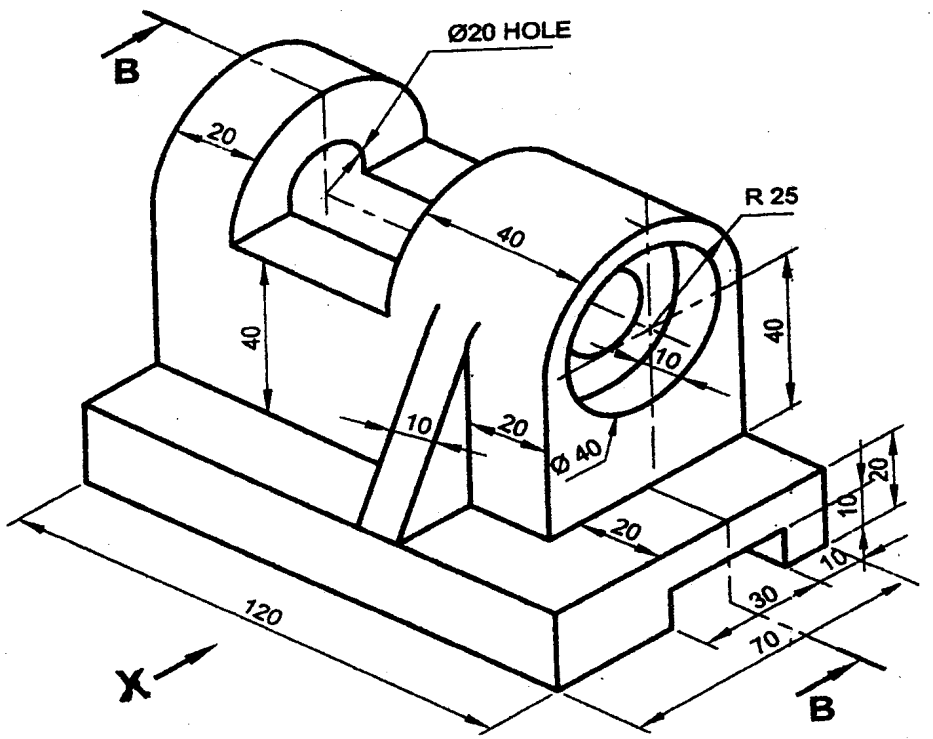


Figure1.

**[ TURN OVER**

2. Figure2 shows the F.V and T.V. of an Object. Draw the following views:-

(a) Sectional Elevation along A-A 4

(b) Sectional Plan along B-B 4

(c) R.H.S.V. 5

Insert at least 8 major dimensions 2

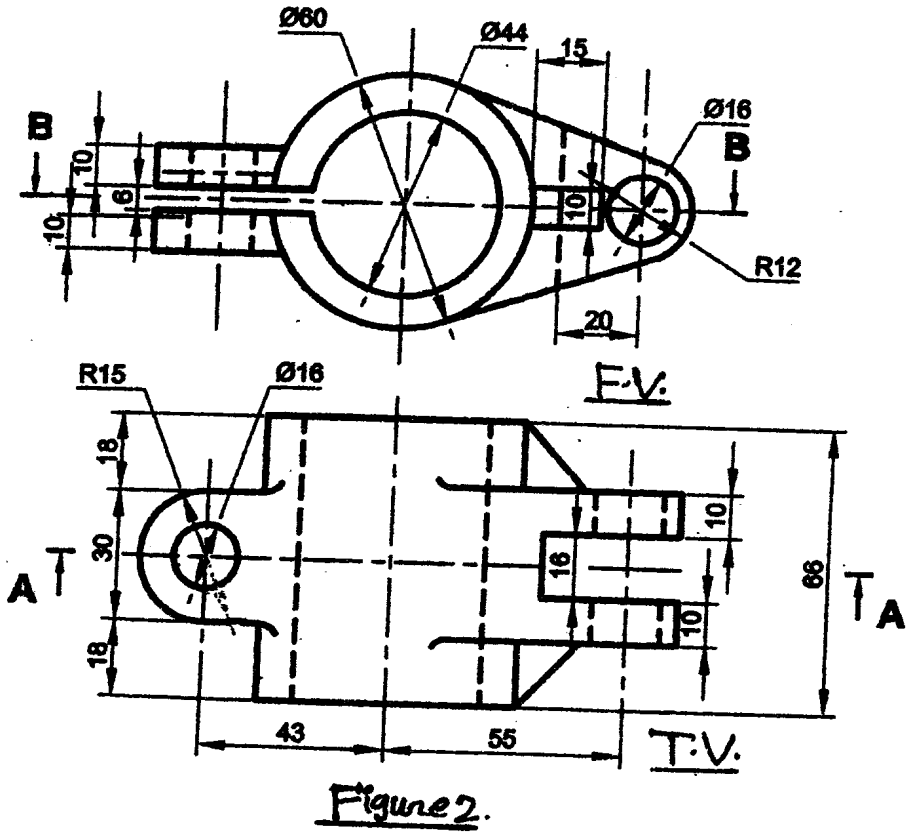


Figure 2.

3. (a) A line PQ, 110 mm long has its plan and elevation lengths 80 mm and 90 mm long. One end of the line P is in HP and the other end Q in VP. Assume the line in the 3rd quadrant. Draw the projections of the line and find its inclination with HP and VP. Also locate its traces (HT and VT). (9)

(b) One end of an inelastic string AB **150.5** mm long is attached to the circumference of a half circular, half hexagonal disc 49 mm diameter. Draw the curve traced out by the other end of the string A when it is completely wound round the circumference of the disc, keeping the string always tight. Take initial position of the string tangent at the midpoint of the circular portion. (6)

4. A right circular cone of base diameter 70 mm and axis length 65 mm is having its apex 25 mm above HP and in the VP. Draw the projections when the solid is resting on VP on one of its generators. (15)

5. A square prism 80 mm long is cut in to two halves, so that the true shape of the cut surface is a rhombus of 40 mm side and one of its angles being $70^0$. Draw the F.V. sectional T.V. and true shape of the section. Also find the cutting plane inclination with H.P, if the prism is resting on HP with rectangular faces equally inclined to V.P. (15)

6. (a) A Square pyramid, side of base 50 mm and height 50 mm is resting on HP on its base with all the edges of the base equally inclined to V.P. A rectangular slot 40 mm wide and 15 mm high is made in the centre at the bottom of the pyramid. Draw the development of the lateral surfaces of the pyramid. Show the position of the slot in T.V. also. (11)

(b) Draw neat, proportionate free hand sketches (Two Views) of the following:-

( i ) I.S. Conventional representation of internal thread (2)

(ii) Hexagonal headed bolt (2)

7. (a) Refer Fig. (7a), Draw an isometric view of the following using natural scale. (11)

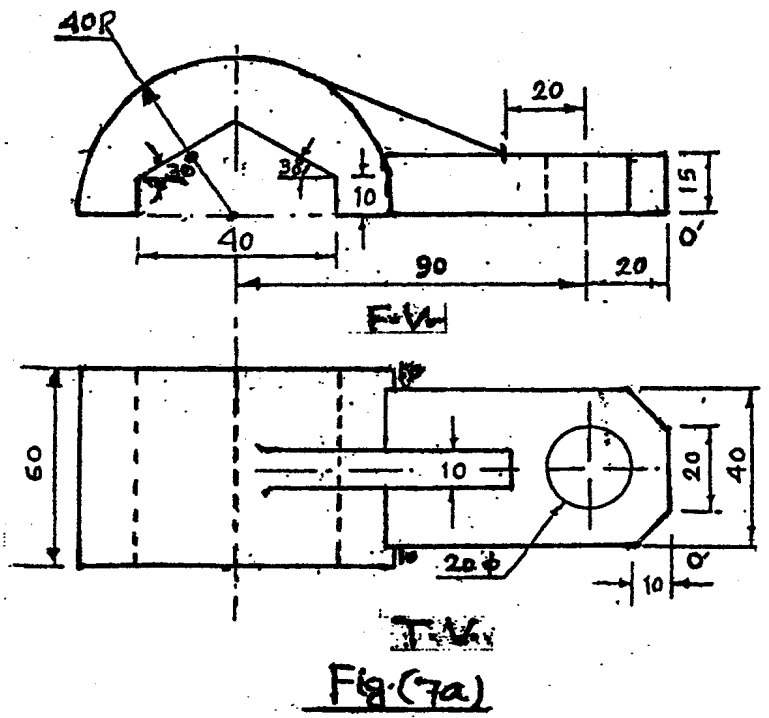


Fig.(7a)

(b) Draw neat, proportionate free hand sketches of the following: (4)

(i) Acme threads profile (ii) Cup or cylindrical headed and conical end set screw (Two Views)

15/6/2011

FE SEM - II
Communication Skills.

P4–Exam.–May–11–243
Con. 3285–11.

**(REVISED COURSE)**

(2 Hours)

**RK–1140**

**[Total Marks : 75**

Note: (1) Question No. **1** is **compulsory.**

(2) Attempt any **four** of the remaining **six** questions.

(3) Answers to **all** the sub-questions should be **grouped together.**

(4) Numbers on **right** indicate **maximum** marks for the question.

**1 a)** Answer **very briefly** and **precisely** any **three** of the following: **6**

I. What is external communication?
II. What is Netiquette?
III. State **two** differences between semi-block and complete block layout.
IV. What are the **four** stages in the process of listening?
V. What is a candidate evaluated for during a Group Discussion? List any **four** factors

**3**

**b) Fill in the blanks:**

I. _____ is the first stage in the process of communication.
II. Informal communication within an organization is called _____ communication.
III. The term to be defined, _____ and _____ - are the important elements of a definition.
IV. The two methods of verbal communication are _____ and _____.

**3**

**c). Match the following:**

| A | B |
|---|---|
| I. Mixed punctuation | a)rapid reading techniques |
| II. Greeting to receiver of letter | b)mechanical barrier |
| III. Easy and quickly transmitted attachments | c) jargon |
| IV. Power failure during an oral presentation | d)receptive skills |
| V. Skimming and scanning | e)salutation |
| VI. Technical or special words | f)e-mail |
| | g) ) modified block style |

**d) Do as directed:** **3**

I. The artist displays his painting about Peace at an exhibition and is awarded the first prize. (Identify the sender, message, channel and feedback). (2)

II. Although Govind is very upset about the new policy, when asked for his opinion, his reply to his boss is, "It is fine, Sir."(Identify the barrier.) (1)

**[TURN OVER**

**2 a) 'Hearing' *is natural; 'listening' needs effort.*** Explain the statement, giving reasons for your answer. **10**

OR

Explain the role of non-verbal communication in improving the effectiveness of a presentation of a Sales Report.

**b)** From the given alternatives, choose the one that is closest in meaning to the underlined word. **5**

I. He was promoted because of his **impeccable** service record.(incredible, flawless, persistent)

II. .Under the new policy, the condition of the villagers **deteriorated** considerably. (altered, demolished, worsened.)

III The **elusive** Osama bin Laden was finally cornered and killed. (wicked, seriously feared, hard to pin down)

IV The formerly enthusiastic accountant **languished** in his tedious job in the government office. (became depressed, became determined, became careful).

V The young lawyer had **ostentatiously** hung his Harvard diploma on the door of his office. (with good taste, in a showy display, in an imbalanced way)

**3 a).** Your company has opened a new branch in Pune. Write a letter inviting quotations for office furniture. Invent necessary details like quality, quantity etc. Use semi-block layout. **9**

**b)** Select any **three** of the following sets and list **two differences** between them: **6**

i) encoding and decoding ii) empathetic listening and critical listening iii) skimming and scanning iv) oral and written communication v) medium and channel.

**4 a).**Write a complete set of effective instructions for welding two pieces of metal together. **9**

**b)** Revise the following sentences as directed: **6**

I. It is impossible to deliver the refrigerator tomorrow.(Make it positive in approach)

II. We acknowledge with thanks the receipt of your communication dated 15 May 2011.(Make it direct and precise)

III. You can help us process your order quickly by sending us another copy of the requisition. (Use the 'You- attitude)

**5a)** As the Purchase Manager of your company, you had ordered 20 laptops from Dell Company, 216 S.V. Road, Bandra, Mumbai 400050.When the consignment arrived; you found five of the pieces in a damaged condition. Write a letter to the Sales Manager claiming suitable adjustment. Decide what form of compensation/ adjustment you want. **7**

b) Write short notes on any two of the following: 8

i) You- attitude ii) Downward communication iii) The importance of feedback in the communication cycle

6a) **Describe** any one of the following objects with a definition, diagram, description of parts and working: **i) Mini drafter ii) Water tap iii) Micrometer** 10

b) Read the following case study and answer the questions given below: 5

**You are considering the promotion of one of your two Sales Executives to the post of Sales Manager. Mr. Prasad is a sincere, highly motivated person with ten years experience. Unfortunately, he is not popular among his subordinates because of his rigidity and insensitivity to the problems and feelings of others. Mr. Anand is not as experienced but has excellent leadership qualities. Since you believe good human relations are important, you decide to give the post to Mr. Anand.**

i) What barriers do you expect in this situation? (2)

ii) What would you do to minimize these barriers? ( 3)

**7 Read the following passage and answer the questions following the passage. For multiple choice questions write only the option you consider correct; answer the open-ended questions in your own words.**

If you are not in the grip of avarice, you will choose a profession that appeals to you as the means of self-expression and social service, even if you cannot earn much money by it. Your daily duty is not just money –making drudgery; it is your contribution to social progress and the path of personal development. How sad must be the lot of the man or woman who must do uncongenial work simply for the sake of more money! I know a younger professor who loved literature passionately and taught it admirably; but his salary was small, and he became a lawyer in order to secure a larger income. I tell you that man was guilty of a crime and he will not be happy as a lawyer, though he may be a little more comfortable, a little better fed and dressed and lodged. A musician who is born a violinist can never be personally happy or socially useful as a prosperous merchant or stock-broker, as he will miss the violin all the time. Avarice puts round men in square jobs and square men in round jobs. At present many persons in all classes, rich and poor, are unhappy and restless because their daily work is not interesting. It does not provide an outlet for their creative impulse and the insistent urge of personality. Therefore, don't ask in youth, "How can I earn the biggest salary?" Ask rather, "How can I truly be happy and do most good to society?"Then you may have less money, but you will have more of life and joy.

1. A man can choose a profession through which he can express himself and serve others 1

a) Only when he doesn't earn a big salary
b) When he joins an N.G.O. or a social service group
c) When he is not motivated by greed
d) When he is a good communicator

2. The author considers the lawyer guilty of a crime because 1

a. As a lawyer he must have committed crimes
b. He has traded his passion for money
c. He doesn't have the capacity to be happy
d. He was not a successful lawyer

3 In the second sentence, the word **drudgery** is closest in meaning to: 1

a) Consuming drugs
b) Plodding
c) Pleasure
d) Business

4 Why are most of the people unhappy at present? 2

5 Who are the misplaced persons according to the writer? 2

6 What is the advice of the writer to the youth? 2

b) Give a suitable title to the above passage and write a summary of it in about 105 words. 6

10/6/2011

F.E II (All Branches)
Computer Programming-II

Con. 3149-11. **RK-1107**

(3 Hours) **[ Total Marks : 100**

**N. B. :** (1) Question No. **1** is **compulsory**.
(2) Answer any **four** out of the remaining **six** questions.
(3) Assume **suitable** data wherever **necessary**.

1. (a) Explain life cycle of Applet. **10**
(b) With example explain the steps to create a package and add a class or interface. **10**

2. Create 3 Vectors Bank, Deposit, Withdraw. Perform following operations :— **20**
   (a) New Customer – data should be added in bank vector.
   (b) Withdrawal of requested amount if the customer exists in Bank vector. The Account no, withdrawal amount and date should be added into withdrawal vector and amount should be deducted from balance in Bank vector.
   (c) Deposition of requested amount if the customer exists in Bank vector. The Account no, amount and date should be added into deposit vector and amount should be added to balance in Bank vector.
   (d) View the contents of an account.

3. (a) Explain Exception handling with programmatic examples. **10**
(b) Write a program in Java to accept a no and compute summation of digits recursively. **10**

4. (a) Explain Thread life cycle. **10**
(b) Write a note on access/visibility specifiers. **10**

5. (a) With suitable examples explain different types of Inheritance. **10**
(b) Write a Java program to accept a no from command line and print the sum of cube of individual digits. **10**

6. State difference between :— **20**
   (a) Applet and Application
   (b) Abstract Class and Interface
   (c) Vector and Array
   (d) String and String Buffer.

7. Write short notes on :— **20**
   (a) Synchronization
   (b) JVM
   (c) Wrapper Class
   (d) toString ()

F.E Sem II CAll Branches)
Applied chemistry - II

P4–Exam. May–11–163

**Con. 3148–11.** **RK–1134**

(2 Hours) **[Total Marks : 75**

**N.B. :** (1) Question No. **1** is **compulsory.**
(2) Attempt any **four** questions from remaining **six** questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) Atomic weights :– C – 12, H – 1, O – 16, S – 32, N – 14, Cl – 35·5, Ba – 137·3.

1. Solve any **five** from the following :– **15**
   (a) Why silver, gold and platinum do not undergo oxidation corrosion ?
   (b) Give composition and uses of Duralumin.
   (c) Define fuels ? Classify fuels with suitable example.
   (d) What are the characteristic properties of composite materials ?
   (e) Explain the prevention of waste principle in green chemistry with suitable example.
   (f) Give important properties of pillared clay.

2. (a) What is cracking ? Describe the manufacture of gasoline by fixed-bed catalytic cracking. What are its advantages ? **5**
   (b) Calculate the mass of Hydrogen evolved by passing a current of 0·5 ampere for 40 minutes through acidified water. **5**
   (c) What are ceramic powder ? Explain the manufacture of aluminimum oxide ceramic powder. **5**

3. (a) What are the necessary conditions for electrochemical corrosion ? Give the mechanism of electrochemical corrosion in acidic medium with diagram and electrode reaction. **5**
   (b) A sample of coal has the following composition by mass. **5**
   C = 85%, H = 6% , O = 8%
   S = 0·5% and Ash = 0·5%
   Calculate the H.C.V. and L.C.V. using Dulong's formula.
   (c) Give conventional and green chemistry route of production of Indigo and express the green chemistry principle adressed in this case. **5**

4. (a) What are structural composites ? Give their types and applications. **5**
   (b) Calculate the Weight and Volume of air needed for complete combustion of 1 kg of coal containing. **5**
   C = 65%, H = 4% , O = 7% , N = 3·0%
   Moisture = 15% and remaining is Ash.
   (Molecular weight of air = 28·949 q)
   (c) Explain Adsorption theory and how it explains – **5**
      (i) Efficiency of Catalyst
      (ii) Selectivity of a Catalyst
      (iii) Specificity of a Catalyst.

**[TURN OVER**

5. (a) Write a notes on any **two** of the following factors influence the corrosion rate – 5
   (i) Passivity (ii) Cathodic protection (iii) Effect of pH.
   (b) 1·95 g of a coal sample was taken for Nitrogen estimation by Kjeldahl method. The ammonia liberated required 9·5 ml of 0·4 N $H_2SO_4$ for neutralization. The same sample of coal weighing 1·5 g in a Bomb's calorimeter experiment produced 0·35 g of $BaSO_4$. Calculate the percentage of N and S. 5
   (c) Define an alloy. What is the purpose of making alloys ? Explain with examples. 5

6. (a) What is knocking ? What are antiknocking agents ? 5
   (b) Write a informative notes on – 6
   (i) Atomization (ii) Compacting.
   (c) Calculate the Percent atom economy for the following reactions – 4

   (i) $CH_3CH = CH_2 + H_2 \xrightarrow{Ni} CH_3CH_2CH_3$.

   (ii) $C_6H_6 + CH_3Cl \xrightarrow{AlCl_3} C_6H_5CH_3 + Hcl$.

7. (a) What is Catalysis ? Give the various types with examples. 5
   (b) 2·5 of air dried coal sample was taken in a silica crucible, after heating it in an electric oven at 105°–110°C for 1 hour, the residue was weighed 2·410g, The residue was heated in a silica crucible covered with vented lid at a temperature 950 $\pm$ 20°C for exactly 7 minutes. After cooling the weight of residue was found to be 1·78g. The residue was then ignited at 750°C to a constant weight of 0·246g. Calculate the percentage of fixed carbon in a coal sample. 5
   (c) Distinguish between brass and bronze. 5

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FE II (All Branches) (Rev)
Applied Mathematics II

**Con. 3096–11.** **RK–1122**

(3 Hours) **[Total Marks : 100**

Note: 1. Question number one is compulsory.

2. Solve any four out of the remaining six questions from Q2 to Q7.

3. Draw neat sketches wherever necessary.

Q.1. [20]

a) Solve $\frac{dy}{dx} + \frac{y\,logy}{x-logy} = 0$

b) Prove that $\int_0^1 (xlogx)^4\,dx = \frac{4!}{5^5}$.

c) Use DUIS to prove that, $\int_0^\infty \frac{\log(1+ax^2)}{x^2}dx = \pi\sqrt{a}$ ,

d) Find the length of arc of r = a (1-cos$\theta$) lying outside the circle r = a cos$\theta$

Q.2.

a) Use method of variation of parameters to solve the equation , $(D^2 - 2D + 2)y = e^x \tan x$ [6]

b) Use Euler's modified method to find the value of y satisfying the equation $\frac{dy}{dx} = \log(x+y)$, [6]
*for* $x = 1.2$ and $x = 1.4$ *correct to three decimals by taking* $h = 0.2$ *and* $y(1) = 2$.

(c) Change the order of integration and evaluate $\int_0^\infty \int_0^x xe^{\frac{-x^2}{y}}\,dydx$. [8]

Q.3 a) Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} \frac{dxdydz}{\sqrt{1-x^2-y^2-z^2}}$ [6]

b) Change to polar co-ordinates and evaluate $\int_0^2 \int_0^{\sqrt{2x-x^2}} \frac{xdxdy}{\sqrt{x^2+y^2}}$. [6]

c) Solve the differential equation $\frac{dy}{dx} = \frac{1}{x+y}$, $y(0) = 1$ for the interval (0, 1) choosing h= 0.5 by [8]
using Runge- kutta Method of fourth order.

**[TURN OVER**

Q.4 a) Solve $(D^2 - 4D + 4)\, y = x^2 + e^x + \cos 2x$ [6]

b) Evaluate $\int_0^{\pi} \frac{dx}{a+b\cos x} : a > 0, b > 0$ (i) $\int_0^{\pi} \frac{dx}{(a+b\cos x)^2} = \frac{\pi a}{(a^2-b^2)^{3/2}}$

(ii) $\int_0^{\pi} \frac{\cos x\, dx}{(a+b\cos x)^2} = \frac{-\pi b}{(a^2-b^2)^{3/2}}$. [6]

c) Solve $(1+x)^2 \frac{d^2y}{dx^2} + (1+x)\frac{dy}{dx} + y = 4\cos\log(1+x)$ [8]

Q.5 a) Find the length of the loop of the curve $3ay^2 = x(x-a)^2$ [6]

b) Solve $\frac{dy}{dx} = x^3y^3 - xy.$ [6]

c) Evaluate $\int\int\int \frac{dxdydz}{(1+x+y+z)^3}$ *over the volume of tetrahedron bounded by planes* [8]

$x = 0, y = 0, z = 0, and\ x + y + z = 1.$

Q.6. a) Prove that $\int_0^{\infty} \frac{dx}{(e^x+e^{-x})^n} = \frac{1}{4}\beta\left(\frac{n}{2}, \frac{n}{2}\right)$ *& hence evaluate* $\int_0^{\infty} sech^8\, x dx.$ [6]

b) Solve $(D^2 - D - 2)\, y = 2\log x + 1/x + 1/x^2$ [6]

C. An electric circuit consists of an inductance L, a capacitance of capacity C and an e.m.f $E = E_0 Cos\omega t$, so that the charge Q satisfies the differential equation $\frac{d^2Q}{dt^2} + \frac{Q}{CL} = \frac{E_0}{L} Cos\omega t$, If $\omega = \frac{1}{\sqrt{CL}}$ and initially $Q = Q_0, at, t = 0, and current, i = i_0, at, t = 0$, find the charge Q at time t.

Q.7 a) Find the mass of the lamina bounded by the curve, $y^2 = ax$, $x^2 = ay$, Where density of the lamina at any point varies as the square of its distance from the origin. [6]

b) Change the order of integration $\int_0^a \int_{\sqrt{a^2-y^2}}^{y+a} f(x,y)dxdy$ [6]

c) I. *Evaluate* $\int_0^{\frac{\pi}{6}} cos^3(3\theta) sin^2(6\theta) d\theta$ [3]

II State and prove Duplication formula. [5]

1/6/2011

F.E II (Rev) All Branches
Applied Physics-II

**Con. 3087-11.** **RK-1095**

( 2 Hours) **[ Total Marks : 75**

**N.B. :** (1) Question No. **1** is **compulsory**.
(2) Solve any **four** questions from question Nos. **2** to **7.**
(3) Use suitable **data** wherever **necessary**.

1. Answer any **five** from the following :— **15**
   (a) Why does the fringe width decrease as order increases in Newton's Rings but remain constant in a wedge shaped film ?
   (b) What is Rayleigh's Criterion of resolution for diffraction ? Write the expression for Resolving Power of grating.
   (c) Explain the role of Heluim in the He-Ne Laser.
   (d) Why are soft magnetic materials used in transformer Cores ?
   (e) What are the functions of the Optical Resonator in a Laser ?
   (f) Using Heisenberg's Uncertainty Principle, show that electrons cannot exist within the nucleus.
   (g) How is the phenomenon of interference used to test for optical flatness ?

2. (a) Obtain the conditions for maxima and minima due to interference in a wedge-shaped film observed in reflected light. Derive the expression for fringe width. **8**
   (b) State the two types of diffraction and differentiate between them. Reduce the missing orders for a double slit Fraunhoffer diffraction pattern if the slit widths are 0·16mm and they are 0·8mm apart. **7**

3. (a) Explain phase velocity of a wave and group velocity of matter waves. Derive the one-dimensional time dependent Schrodinger wave equation for matter waves. **8**
   (b) Explain the refractive-index profiles of step index and graded index fibres. An optical fibre has a Numerical Aperture of 0·20 and a cladding refractive index of 1·59. Determine the acceptance angle for the fibre in water which has a refractive index of 1·33. **7**

4. (a) Explain how the wave length of a spectral line can be determined in the laboratory using a plane trasmission grating. White light falls normally on a soap film of refractive index 1·33 and of thickness 5000 Au. What wavelength within the visible spectrum will be strongly reflected ? **8**
   (b) With neat diagrams explain the construction and working of a Nd : YAG Laser. Discuss the pumping scheme. **7**

**[ TURN OVER**

5. (a) What is the role of Laser in the field of communication ? Explain Numerical Aperture and derive the same for step index fibres. **8**

(b) Draw a graph to show the variation of magnetic induction 'B' with applied magnetic field 'H' in case of ferromagnetic materials. Calculate the members of ampere turns required to produce a flux of $10^{-3}$ weber round an iron ring of $5cm^2$ cross section and 20mm mean diameter having an air gap 2mm wide across it. The relative permeability of iron is 1000. Neglect the leackage flux. **7**

6. (a) Explain the atomic origin of ferromagnetism. Differentiate between diamagnetic and paramagnetic materials. **8**

(b) What is the physical significance of the wave function $\Psi$ of a matter wave ? An electron is bound in a one-dimensional potential well of width 2Au, but of infinite height. Find its energy values in the ground state and first two excited states. **7**

7. Write short notes on any **three** of the following :— **15**

(a) Rotary Pump

(b) SEM

(c) Penning gauge

(d) AFM

(e) Application of Vacuum Technology.