

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL  
UNIVERSITY, LONERE - RAIGAD - 402 103  
Semester Examination: December - 2017**

Branch: All Courses

Semester: I

Subject with Subject Code: Engineering Mathematics-I  
(MATH101)

Marks: 60

Date: 11/12/2017

Time: 3 Hrs.

Instructions to the Students:-

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

**Q.1. (a)** For what value of  $\lambda$  the following system of linear equations is consistent and solve it completely in each case: (Marks)  
(06)

$$x + y + z = 1, x + 2y + 4z = \lambda, x + 4y + 10z = \lambda^2.$$

**(b)** Find the eigen values and the corresponding eigen vectors for the matrix

$$A = \begin{bmatrix} 1 & 0 & -4 \\ 0 & 5 & 4 \\ -4 & 4 & 3 \end{bmatrix} \quad (06)$$

**Q.2. (a)** If  $y = \sin px + \cos px$ , then prove that  $y_n = p^n [1 + (-1)^n \sin(2px)]^{\frac{1}{2}}$ . (04)

**(b)** If  $y = e^{a \cos^{-1} x}$ , then prove that  $(1 - x^2)y_{n+2} - (2n+1)x y_{n+1} - (n^2 + a^2)y_n = 0$ . (04)

**(c)** Expand  $y = \log(\cos x)$  about the point  $x = \frac{\pi}{3}$  up to third degree by using Taylor's series. (04)

**Q.3. Attempt Any Three:** (12)

(a) If  $x^y z^x = c$ , then prove that at point  $x=y=z$ ,  $\frac{\partial^2 z}{\partial x \partial y} = -(x \ln ex)^{-1}$ .

(b) If  $u = \tan^{-1}\left(\frac{x^3+y^3}{x-y}\right)$ , prove that  $x^2 \frac{\partial^2 u}{\partial x^2} + y^2 \frac{\partial^2 u}{\partial y^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} = \sin 4u - \sin 2u$ .

(c) If  $x^2 = au + bv$ ,  $y^2 = au - bv$  and  $z = f(u, v)$ , then prove that  $x \frac{\partial z}{\partial x} + y \frac{\partial z}{\partial y} = 2\left(u \frac{\partial z}{\partial u} + v \frac{\partial z}{\partial v}\right)$ .

(d) If  $u = \sin\left(\frac{x}{y}\right)$  where  $x = e^t$ ,  $y = t^2$ , then find  $\frac{du}{dt}$ .

**Q.4. Attempt Any Three:** (12)

(a) If  $ux = yz$ ,  $vy = zx$ ,  $wz = xy$ , then prove that  $J J^* = 1$  where  $J = \frac{\partial(u, v, w)}{\partial(x, y, z)}$  and  $J^* = \frac{\partial(x, y, z)}{\partial(u, v, w)}$ .

(b) If the sides and angles of a plane triangle vary in such a that its circum-radius remains constant, then prove that  $\frac{da}{\cos A} + \frac{db}{\cos B} + \frac{dc}{\cos C} = 0$ .

(c) A rectangular box open at the top is to have volume of 32 cubic units. Find the dimensions of the box requiring the least material for its construction by Lagrange's method of undetermined multipliers.

(d) Expand  $f(x, y) = x^y$  as far as second degree in the powers of  $(x-1)$  and  $(y-1)$  using Taylor's theorem.

**Q.5. Attempt Any Three:** (12)

(a) Change the order of integration and evaluate  $I = \int_0^{\frac{\pi}{2}} \int_x^{\frac{\pi}{2}} \frac{\cos y}{y} dx dy$ .

(b) Use elliptical polar form to evaluate  $I = \iint_R xy \left(\frac{x^2}{a^2} + \frac{y^2}{b^2}\right)^{\frac{n}{2}} dx dy$ , where R is the region of ellipse in positive quadrant.

(c) Use spherical polar transformation to evaluate  $I = \int_0^{\infty} \int_0^{\infty} \int_0^{\infty} \frac{dz}{(x^2 + y^2 + z^2)^2}$ .

(d) Find the centroid of the positive loop of the curve  $r^2 = a^2 \cos 2\theta$ .

**Q.6. (a)** Test the convergence of the series  $\sum_1^{\infty} \left(\frac{n^2}{2^n} + \frac{1}{n^2}\right)$ . (04)

**(b)** Test the convergence of the series  $\sum_1^{\infty} \frac{(n+1)^n x^n}{n^{(n+1)}}$ . (04)

**(c)** Test the absolute convergence of the series  $\sum_2^{\infty} \frac{(-1)^n}{n(\ln n)^2}$ . (04)

B) A passenger train passes a certain station at 60 km/hr and covers a distance of 12 km with this speed and then stops at the next station 15 km from the first with uniform retardation. A local train starting from the first station covers the same distance in double this time and stops at the next station. Determine the maximum speed of the local train which covers a part of the distance with uniform acceleration and the rest with uniform retardation. (6M)

Q.5.

A) Explain in detail: D'Alembert's principle and write the equations of dynamic equilibrium of the particle. (4M)

B) Two blocks of masses  $M_1$  and  $M_2$  are connected by a flexible but inextensible string as shown in the figure. Assuming the coefficient of friction between block  $M_1$  and horizontal surface to be  $\mu$  find the acceleration of the masses and tension in the string as per figure 6. Assume  $M_1 = 10$  kg and  $M_2 = 5$  kg,  $\mu = 0.25$ . (8M)

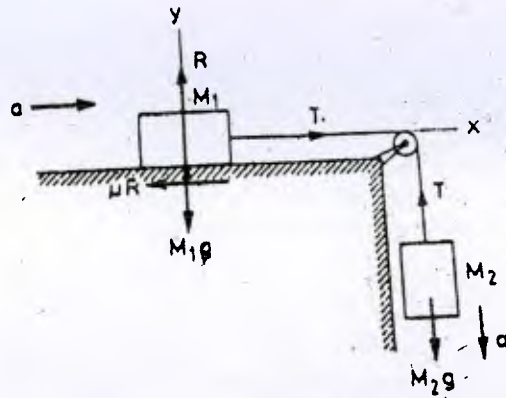


Figure 6

Q.6.

A) A spring of stiffness 1000 N/m is stretched by 10 cm from the undeformed position. Find the work of the spring force. Also find the work required to stretch it by another 10 cm. (6M)

B) What do you understand by direct central impact? Also explain the coefficient of restitution. (6M)

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY  
LONERE - RAIGAD - 402 103  
End Semester Examination - December - 2017

Branch: B. Tech (Group A/Group B)

Semester: I

Subject with Subject Code: Engineering Mechanics  
[ME102]

Marks: 60

Date:- 13/12/2017

Time: 3 Hrs.

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

(Marks)

Q.1. A) How will you add two forces? Explain the Parallelogram Law and Law of Triangle of forces. (6M)

B) Two ropes are tied together at C. If the maximum permissible tension in each rope is 3.5 kN, what is the maximum force P that can be applied and in what direction as shown in figure 1. (6M)

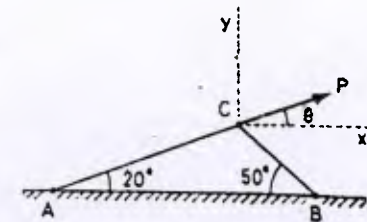


Figure 1

Q.2. A) What are various types of supports and support reactions? Explain with its free body diagram. (4M)

B) Using the method of joints, find the axial forces in all the members of a truss with the loading shown in the Figure 2. (8M)

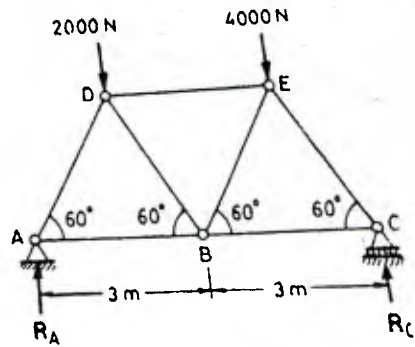


Figure 2

Q.3.

- A) Locate the centroid of the shaded area obtained by removing a semicircle of diameter  $a$  from a quadrant of a circle of radius  $a$  as shown in Fig. 3. (6M)

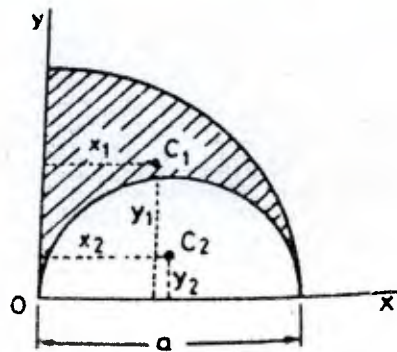


Figure 3

- B) A 7m long ladder rests against a vertical wall, with which it makes an angle of  $45^\circ$ , and on a floor. If a man, whose weight is one half of that of the ladder, climbs it, at what distance along the ladder will he be, when the ladder is about to slip shown in Figure 4? The coefficient of friction between the ladder and the wall is  $1/3$  and that between the ladder and the floor is  $1/2$ . (6M)

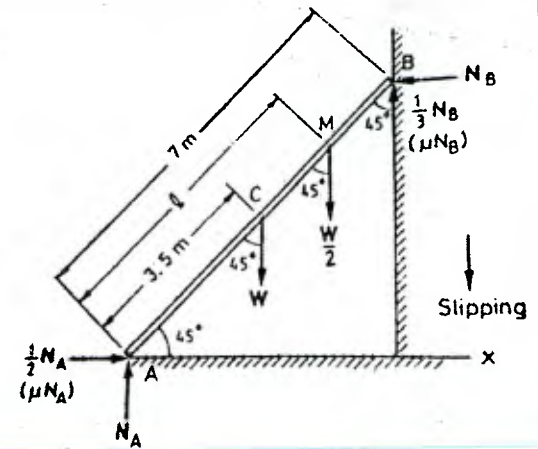


Figure 4

Q.4.

- A) A trolley resting on a horizontal plane starts from rest and is moved to the right with a constant acceleration of  $0.18 \text{ m/s}^2$  shown in Figure 5. Determine:  
 i) acceleration of the block B connected to the trolley and  
 ii) velocities of the trolley and the block after a time of 4 seconds and the distance moved by each of them. (6M)

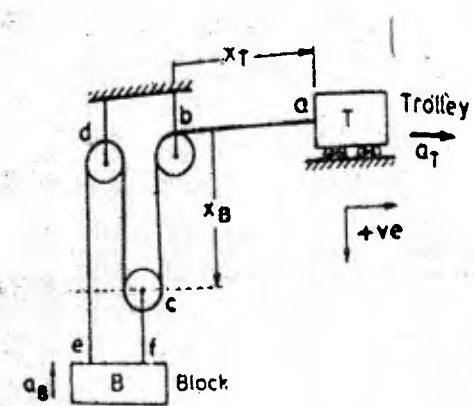


Figure 5

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY**  
**LONERE – RAIGAD – 402 103**  
**End Semester Examination – December – 2017**

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**Branch: B. Tech (Group 'A'/Group 'B')** Semester – I  
**Subject: Communication Skills (HS 102)** Marks: 60  
**Date: 13/12/2017** Time: 3 Hrs  
.....

Q: 1 a) Define 'Communication' and draw a neat diagram showing the stages in the process of communication. 6  
b) Write the types of Non-Verbal Communication and explain them. 6

**OR**

Mention the barriers to effective communication and the ways to overcome them. 12

Q: 2

- a) What are the techniques of Group Discussion? 6
- b) Explain in brief the types of Interview Questions 6
- c) What are the steps of effective presentation 6
- d) Write the telephonic etiquettes. 6

Q: 3

- a) Draw a neat diagram of organs of speech with proper labels. 6
- b) Write phonemic transcription of the following words (Any Three)  
i) Education ii) furniture iii) tomorrow iv) remember. 6
- c) Write the spelling for the following transcription.  
i) /'neibə/ ii) /'jestədɪ/ iii) /'wɪndəʊ/ iv) /'tʃɒklɪt/ 6

Q: 4 a) Write the sentences with correct articles wherever necessary. (Any Three) 3

- i I shall send you ..... e- mail.
- ii) Would you please wait for ..... minute.
- iii) Please attend ..... meeting on my behalf.
- iv) She can drive ..... car.

b) Fill in the blanks with correct prepositions. (Any Three) 3

- i Encoding is the process of changing information ..... logical, coded message.
- ii Silver is the best conductor ..... heat.
- iii My house is ..... to the city post office.
- iv I go to college daily ..... Nine O' Clock.

c) Correct the following sentences. (Any Three) 3

- i There is many solutions to this problem.
- ii The reaction between an acid and a base take place in microseconds.
- iii Photosynthesis and photography involve both light sensitive reactions.

- iv The girl and her sister is well known debaters.
- d Rewrite the sentences using the tense form given in the bracket. (Any Three) 3
- i He (Run) a marathon this Sunday. (Future continuous Tense)
- ii They (Gift) him a lovely painting on his birthday. (Past Perfect Tense)
- iii She (Go) to hometown every weekend. (Simple Present)
- iv I (Work) in this company for ten years. (Present Perfect Continuous Tense)
- Q: 5 a) Write a report on 'Global Warming'. 6
- b) Write a short essay on 'Use of Mobile in Communication'. 6
- OR**
- c) Write an Application Letter with appropriate Resume with the following details  
'Required an Assistant Engineer in Tata Company, Jamashedpur. Candidate with  
engineering degree having 2 years experience'. 12
- Q: 6 Write any two of the following.
- a) What the strategies to become a good listener? 6
- b) Explain in brief the types of reading. 6
- c) Write note on Active listening and Passive listening. 6

----- End -----

**Dr. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY**  
**LONERE – RAIGAD – 402103**

**End Semester Examination – December – 2017**

**Branch: F.Y. B.Tech.**

**Semester: I**

**Subject: Engineering Physics (PHY103)**

**Marks: 60**

**Date: 15 / 12 / 2017**

**Time: 3 Hrs.**

**Instructions to the Students:**

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagrams etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

**Q1. Attempt the following:**

- a. Obtain the differential equation of wave motion. (6)
- b. What is Piezoelectric and Magnetostriction Effect? (4+2)

Calculate the natural frequency of 40 mm length of a pure iron rod. Given the density of pure iron is  $7.25 \times 10^3 \text{ kg/m}^3$  and its Young's Modulus is  $115 \times 10^9 \text{ N/m}^2$ . Can you use it in magnetostriction oscillator to produce ultrasonic waves?

**Q2. Attempt any TWO of the following:**

- a. Derive an expression for the optical path difference for the reflected rays in a thin film of constant thickness and hence find the conditions for maxima and minima. (6)
- b. What is double refraction? Explain the difference between ordinary ray (O-ray) and extra ordinary ray (e-ray). (6)
- c. What is population inversion and stimulated emission? (4+2)

Calculate the acceptance angle of an optical fibre where the refractive index of core is 1.55 and that of cladding is 1.50.

**Q3. Attempt the following:**

- a. With neat diagram explain principle and working of Bainbridge Mass Spectrograph. (6)
- b. Derive the time independent Schrodinger's wave equation. (6)

**Q4. Attempt the following:**

- a. Define atomic radius. Calculate atomic radii in SC, BCC and FCC lattices with suitable diagrams. (4+2)

Lead exhibits FCC structure. Each side of unit cell is of  $4.95 \text{ \AA}$ . Calculate radius of lead atom.

**OR**

a. Derive the relation between interplaner spacing 'd' defined by Miller Indices (hkl) and lattice parameter 'a'. (4+2)

Calculate the interplaner spacing for (220) plane where the lattice constant is  $4.938 \text{ \AA}$ .

b. What is X-ray? How do we get the continuous spectrum in X-rays explain. (4+2)

An X-ray is operated at 20 kv. Calculate the minimum wavelength of X-rays emitting from it.

**Q5. Attempt the following:**

a. On the basis of domain theory explain B-H curve and hence explain retentivity and coercivity. (6)

b. What is Superconductivity? Explain Meissner Effect in Superconductors. (2+4)

**Q6. Attempt the following:**

a. What is Hall effect? Derive an expression for Hall Coefficient. (6)

b. Derive an expression for electromagnetic wave in free space and hence calculate the value of velocity of light in free space. (6)

**----- END OF PAPER -----**



**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY**  
**LONERE – RAIGAD – 402 103**  
**Semester Examination – December – 2017**

Branch: B. Tech.

Semester: I

Subject with Subject Code: Engineering Chemistry  
(CHM103)

Marks: 60

Date: 15 / 12 / 2017

Time: 3 Hrs.

**Instructions to the Students:**

1. Each question carries 12 marks.
2. Attempt any FIVE questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

(Marks)

**Q.1. Attempt Any TWO questions of the following:**

- a) Explain Ion Exchange process of softening of water with its advantages and disadvantages. (06)
- b) How does the Hardness of water determined by EDTA complexometric method? (06)
- c) Write note on Chemical Oxygen Demand (COD). (06)

- Q. 2.** a) State Phase rule equation. Explain the term Component of phase rule with examples. (06)
- b) What is meant by Eutectic point? Explain Silver-lead two component alloy system with phase diagram. (06)

- Q.3.** a) Describe the process of electrolytic refining of crude copper metal. (06)
- b) Explain the Gravity separation and Magnetic separation method for physical concentration of metals. (06)

**Q.4. Attempt Any TWO questions of the following:**

- a) Give the classification of fuels and explain characteristics of good fuel. (06)
- b) Discuss the Proximate analysis of coal with its significance. (06)
- c) Explain Thick film and Thin film lubrication with suitable examples. (06)

- Q.5.** a) How does Ethyl alcohol manufactured from molasses by Fermentation process? (06)
- b) Explain synthesis, physical-chemical properties and uses of Pyridine. (06)

**Q.6. Attempt Any TWO questions of the following:**

- a) Define the terms Ohms Law, Specific conductance, Equivalent conductance, Molecular Conductance and Cell constant with their units. (06)
- b) Explain in detail Debye-Huckel theory of Strong electrolyte. (06)
- c) Write note on: Glass Electrode. (06)

----- END OF PAPER -----

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,  
LONERE - RAIGAD - 402 103  
End Semester Examination - December - 2017**

**Branch: B.Tech.**

**Semester: I**

**Subject: Engineering Graphics [ME104]**

**Marks: 60**

**Date: 18 / 12 / 2017**

**Time: 4 Hrs.**

**Instructions to the Students**

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.
5. Retain all construction lines.

- Q.1.** a.) Inscribe a regular Pentagon in a circle of diameter 70 mm. (6)  
b.) Inscribe a Square in a circle of diameter of 70 mm. (6)

- Q.2** Draw Front View in the Direction of X and Left-Hand Side view of the given object in **Fig. I** Orthographic Projections. (12)

- Q.3.** Draw the Projections of line "AB", if Point "A" is 20 mm above HP & 30 mm in front of VP, Point "B" is 75 mm above HP & 60 mm in front of VP & distance between Projectors of AB is 60 mm. Find HT, VT, True Length of line & Angle made with HP. (12)

- Q.4.** Draw the projections of Pentagonal pyramid side of base 25 mm & height of axis 70 mm if its one of the triangular side face is in VP & the base edge containing that face is inclined at  $45^\circ$  to HP such that the apex is away from observer. (12)

Q.5. A. Draw isometric drawing of given object in Fig. II Isometric Drawing (12)

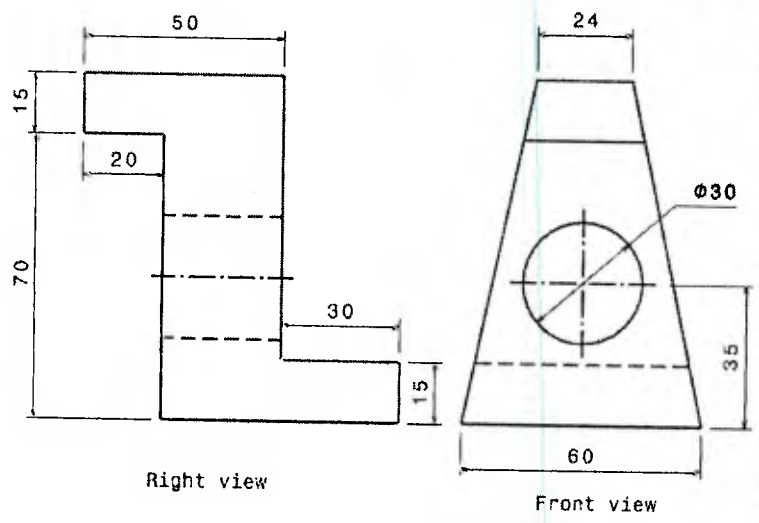


Fig. Isometric Drawing

Fig. II

OR

B) A Hexagonal Pyramid side of base 25 mm & height of Axis 70 mm lying on ground on one of its triangular side face is with axis parallel to VP. Draw the projections if it is cut by the Horizontal Cutting Plane by passing through mid-point its axis. (12)

Q.6. Draw the Development of cone given in the Fig. III Development of Cone. (12)

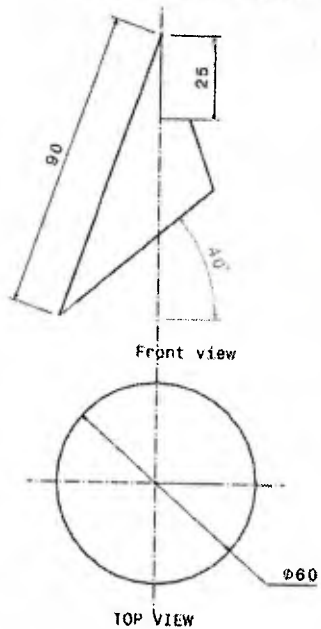


Fig. Development of Cone

Fig. III

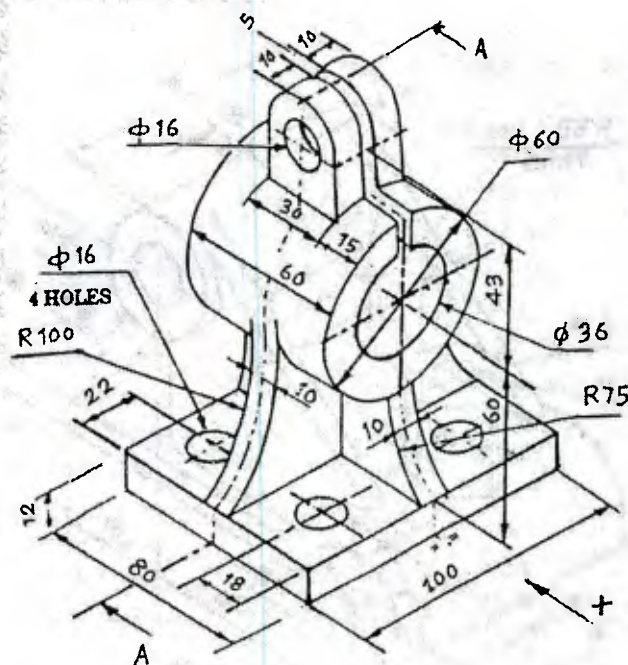


Fig. I Orthographic Projection

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**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY**  
**LONERE – RAIGAD - 402 103**  
**Semester Examination – December - 2017**

Branch: B. Tech.

Semester: I

Subject with Subject Code: Basic Electrical Engineering  
[EE104]

Marks: 60

Date: 18 / 12 / 2017

Time: 3 Hrs.

**Instructions to the Students:**

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

**Q.1.**

(a) Define resistance temperature coefficient and prove that  $R_2 = R_1 [1 + \alpha_1 (\theta_2 - \theta_1)]$   
where  $R_2$  = resistance at temperature  $\theta_2$  °C     $R_1$  = resistance at temperature  $\theta_1$  °C ,  
 $\alpha_1$  = temperature coefficient at  $\theta_1$  °C . (6M)

(b) An electric water heater raises the temperature of 20 liter of water from 20 °C to 100 °C . If efficiency of heater is 90% calculate the energy consumed by the heater in joules and in kWh? The specific heat capacity of water is 4190 J/kg K. (6M)

**Q.2.**

(a) For the network shown in fig. 1 determine: (6M)  
i) the voltage drop in each resistor and  
ii) current in each resistor.

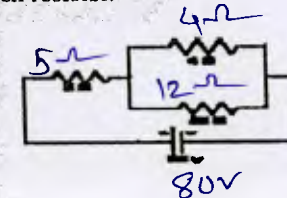


Fig.1. Q2(a)

(b) State and explain Superposition theorem. (6M)

OR

(b) Find the current through  $20\Omega$  resistance using KVL for the network shown in fig. 2. (6M)

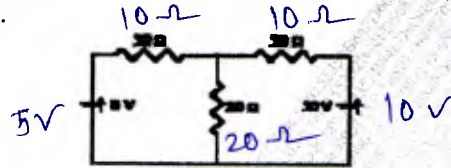


Fig.2. Q.2 (b)

Q.3

(a) Define i) RMS value ii) Form factor, iii) Peak factor for sinusoidal wave. (6M)

(b) Two voltages are represented by  $V_1 = 100 \sin 314t$  &  $V_2 = 150 \sin \left( 314t + \frac{\pi}{6} \right)$ . Calculate the resultant voltage and express it in the form  $V = V_m \sin(314t + \phi)$ . (6M)

OR

(b) Write the expression for the current flowing through  $100 \mu\text{F}$  capacitor when the voltage  $V = 15 \sin 2000\pi t$  is applied across it also sketch the waveform of the current showing the phase relationship to the applied voltage. (6M)

Q.4

(a) Explain with neat circuit the resonance in series RLC circuit. (6M)

(b) A coil of resistance  $6\Omega$  and inductance  $16\text{mH}$  is connected in series with another coil of resistance  $10\Omega$  and inductance  $0.02\text{H}$ . A  $230\text{V}$ ,  $50\text{Hz}$  supply connected across it. Calculate

- i) Total circuit impedance
- ii) Total circuit current
- iii) Voltage and current phasor (6M)

Q.5.

(a) Explain the meaning and give practical example of each effect: (6M)  
i) self induced emf  
ii) mutually induced emf.

(b) A magnetic core in the form of closed ring, has a mean length of  $15\text{cm}$  and across section of  $1\text{cm}^2$ . The relative permeability of iron is  $2400$ . What direct current will be needed in a coil of  $1800$  turns uniformly round the ring to create a flux of  $0.2\text{mWb}$  in the iron? (6M)

Q.6

(a) Derive the EMF equation of transformer. (6M)

(b) Explain charging of capacitor and define time constant. (6M)

----- END OF PAPER -----

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,**

**LONERE – RAIGAD - 402 103**

**End Semester Examination – December - 2017**

**Branch: B.Tech.**

**Semester: I**

**Subject with Subject Code: Energy and Environmental  
Engineering (CHE106)**

**Marks: 60**

**Date: 20 / 12 / 2017**

**Time: 3 Hrs.**

**Instructions to the Students:**

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram, etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

**Q.1. Solve any Two of the following:**

**(6 × 2 = 12)**

- (a) Explain the working of a Hydro Electric Power plant with a neat diagram? Write at least four advantages and disadvantages each of the Hydro Electric Power.
- (b) Enumerate the various systems and components used in Thermal Power plant. Describe Fly ash circuit and Cooling water circuit in these power plants.
- (c) What are the fossil fuels used for generation of conventional power? Write the correct type of energy produced by the following power plants.
  - i) kalkappam in Tamil Nadu,
  - ii) Reliance Power in Pokharan in Rajashtan,
  - iii) Almatti in Karnataka, and
  - iv) Koradi in Maharashtra

**Q.2. Solve any Two of the following:**

**(6 × 2 = 12)**

- (a) How the wind mills are classified? Show with a flow chart. Explain briefly about vertical wind mill with a neat sketch.
- (b) Define solar energy? What is flat plate collector? Describe its components with suitable sketch.
- (c) Give classification of fuel cells using a flowchart. What are the advantages and disadvantages of a fuel cell? State any four each.

**Q.3. Attempt the following:**

- (a) What do you mean by energy conservation? Explain the measures to be taken to reduce the energy conservation in domestic refrigerator. List any four measures. (6 × 2 = 12)
- (b) What is energy efficiency? Write atleast six practices that lead to increase in energy efficiency of the home appliances viz. mixer-grinder, water heater, flour mill, electric lighting, air conditioner, etc.

**Q.4. Attempt the following:**

(6 × 2 = 12)

- (a) What is the difference between primary and secondary air pollutants? Give some examples of each? List several illnesses that are caused by the dirty air.
- (b) What is "sick building syndrome"? How do you prevent it? Write any four corrective steps for making air free from lead as a particulate matter pollutant.

**Q.5. Solve the following:**

(6 × 2 = 12)

- (a) What are the main causes of water pollution? Write at least four measures to be taken for controlling water pollution.
- (b) What are the sources and their corresponding effects of noise pollution on human health? Explain in detail.

**Q.6. Solve the following:**

(6 × 2 = 12)

- (a) Define the term Water Pollution. Explain BOD and Eutrophication in connection with water pollution.
- (b) What are the various methods of safe disposal of wastes? Describe the process of municipal sewage treatment with a simple sketch.
-

```

B) #include<stdio.h>
void sortins(int f[],int p){
int temp, i, j;
for(j = 1; j < p; j++){
temp = f[j];
i=j-1;
while(i >= 0 && f[i] > temp){
f[i+1] = f[i];
i--;
}
f[i+1] = temp;
}
}

void main(){
int A[8] = {27, 25, 73, 65, 30, 68, 39, 77};
sortins(A,8);
}

```

[3]

Write the values of f[i] in each iteration when it is inside while loop.

- C) Define Array. [1]  
Initialize two dimension array and show matrix representation of initialized two dimension array. [2]  
Write C statements for one dimension array to do the following: [2]  
i. Set the value of the 5<sup>th</sup> component of the alpha array to 35.  
ii. Set the value of the 9<sup>th</sup> component of the alpha array to the sum of the 6<sup>th</sup> and 13<sup>th</sup> components of the alpha array.

Q. No. 6

- A) Define a structure in C named 'Student' which contains four fields as {name, age, gender, department}. Declare a variable as your name of 'struct Student'. Assign the values for your structure as xyz, 23, Male, Computer respectively. [3]
- B) Write a program in C to create a structure having named as Employee consists of empCode, name, department, address and salary as its members. Use array of structure to read the details for five employees from user and then display the data entered by the user on Screen. [6]
- C) Date is an entity which consists of hours, minutes and seconds. Account is a second entity which consists of acct\_no, acct\_type('S' for saving and 'C' for current), name\_of\_account\_holder, balance in respective acct\_no, date\_of\_lastpayment which is already defined using Date entity. Write a syntax in C from given data and also initialize the value to every elements using dot operator. [3]

----- END OF PAPER -----

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY**  
**LONERE - RAIGAD - 402 103**  
**Semester Examination - December - 2017**

Branch: B. Tech.

Semester: I

Subject with Subject Code: Basic Computer Programming  
[ICT106]

Marks: 60

Date: 22 / 12 / 2017

Time: 3 Hrs.

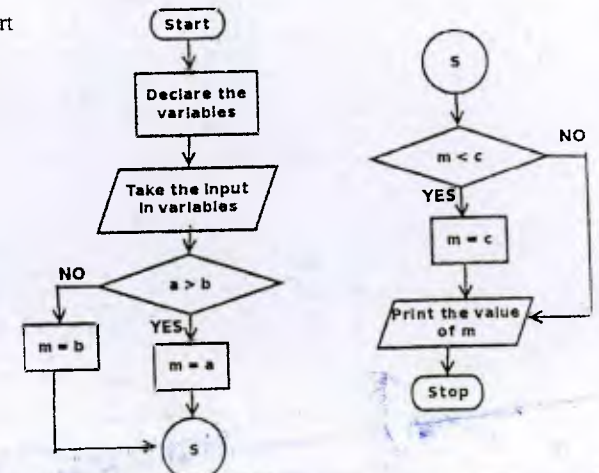
- Instructions: 1] Attempt any 5 Questions.  
2] Figures / structures to the right indicate full marks.  
3] Each Question Carry 12 Marks.  
4] Assume suitable data, if necessary.  
5] Neat diagrams must be drawn wherever necessary.

Q. No. 1

- A) 1. What do curly braces denote in C? Why does it make sense to use curly braces to surround the body of function? [2]  
ii. Consider the statement: `double ans = 10.0 + 2.0 / 3.0 - 2.0 * 2.0;` [1]  
Rewrite this statement, inserting parenthesis to ensure that `ans = 11.0` upon evaluation of this Statement. [1]  
iii. Explain why given statement is not correct, and fix it. [1]  
`#include "stdio.h".`

B) Explain the various phases of process of programming in details. [4]

C) Convert the following Flowchart into C Program. A single flowchart divided into two part where S is branching to show continuous flow of a program.





**Q. No. 2**

- A) Write logical expressions that tests whether a given character variable in C is [4]  
i. lower case letter  
ii. upper case letter  
iii. digit  
iv. whitespc (includes tab, space, newline)

- B) Evaluate the expression:  $1 \ \&\& \ 0 \ \% \ 10 \ >= \ 0 \ \&\& \ 30 \ \% \ 10 \ <= \ 3$ . Show the steps of your [4]  
expression evaluation.

Write the values of the following expressions.

- i. 'F' - 'C'  
ii.  $2.0 + (\text{float})(5/3)$

**OR**

- B) With proper example explain following Bitwise Operators: [4]  
i. Left Shift Operator  
ii. Bitwise AND  
iii. Right Shift Operator  
iv. Bitwise Complement Operator

- C) Define the variable in C. What are the rules programmer has to follow for declaration of [4]  
any variable. Give an example of variable declaration and variable initialization.

**Q. No. 3**

- A) Telephone company charges its domestic consumers as follows: [4]

No. of phone Calls	Rate of Charge
0 – 200	Rs. 0.50 per unit
201 – 400	Rs. 100 plus Rs.0.65 per unit excess of 200
401 and above	Rs. 230 plus Rs.0.80 per unit excess of 400

Write a program that reads the customer telephone number and number of phone calls and prints the amount to be paid by the customer.

**OR**

- A) The digital root of a number is single digit number obtained by an iterative process of [4]  
summing digits. Digital sum of 65536 is 7, because  $6+5+5+3+6=25$  and  $2+5 = 7$ . Write a program that takes an integer as input and prints its digital root.

- B) Differentiate between: [4]  
i. While Loop and do.....while Loop.  
ii. break and continue statement.

- C) i. Write the syntax of switch statement. [1]  
ii. What will be the output of the following program? [3]

```
#include <stdio.h>
int main(){
    int i, j, k;
    for(i=1;i<10;i++){
        printf("\n %d: ", i);
        for(j=1;j<10;j++){
            if(i%3 == 0) break;
            if(i > j) continue;
            k=i*10+j;
            printf(" %d", k);
        }
    }
}
```

**Q. No. 4**

- A) What will be printed by the following program? [3]

```
int f(int a){
    printf("%d", a);
    a++;
    return a;
}
int main(){
    int a = 5, b;
    b = f(a);
    printf("%d,%d\n", a, b);
    return 0;
}
```

- B) Write a program in C which take an integer number x from user. Write a function which [3]  
find given number is Armstrong or not i.e. void armstrong(int n) which not return any value. Take input value x in main() function and use function call armstrong(x). In function, void armstrong(int n) display message as "Enter number is \_\_\_\_\_ is an armstrong number" OR "Enter number is \_\_\_\_\_ is not an armstrong number"

- C) i. What do you mean by recursion? [1]  
ii. With proper example give the syntax of function call, and function definition. [3]  
when programmer has to use function prototype in program. Give syntax of function prototype.  
iii. Explain any one Static Storage Class with a proper C code. [2]

**Q. No. 5**

- A) A teacher has to enter mark of 5 subjects of a student and has to find the average of that [4]  
marks. Which data type would you suggest to programmer and write C program to take the input from programmer and find the average of entered marks. Also Display data entered by programmer and average find through program on Screen.

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**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,  
LONERE - RAIGAD - 402 103  
Semester Examination - November - 2017**

Branch: B. Tech. (Group A / Group B)

Semester: I

Subject with Subject Code: Basic Civil Engineering  
(CV105)

Marks: 60

Date: 22 / 12 / 2017

Time: 3 Hrs.

- Instructions:** 1] Attempt any 5 Questions.  
2] Figures / structures to the right indicate full marks.  
3] Each Question Carry 12 Marks.  
4] Assume suitable data, if necessary.  
5] Neat diagrams must be drawn wherever necessary.

**Q. No. 1**

- A) Describe the properties of good bricks used in building construction. (6)
- B) What is meant by cement concrete? Explain the function of main ingredients of cement concrete. (6)

**Q. No. 2**

- A) Write a short note on bearing capacity of soil. (4)
- OR**
- A) Draw a neat sketch of double shuttered panelled door and name the different parts. (4)
- B) Explain with neat sketch the different types of shallow foundations. (8)

**Q. No. 3**

- A) Differentiate between load bearing and framed structures. (4)
- B) Draw a typical plan of a residential building using the following data: (8)  
(Plan can be drawn using scale or with freehand sketching showing appropriate wall thickness, sufficient number of doors and windows, and with internal room dimensions).  
The minimum number of rooms and their sizes mentioned in bracket can be taken as:  
Sit out (Verandah) - 01 (2.1m x 3m)

Living Room (Hall) - 01 (3.6m x 4.8m)  
Bed Room - 02 (3m x 3.6m)  
Kitchen - 01 (2.4m x 3m)  
Bath Room - 02 (1.2m x 1.8m)  
Water Closet (Toilet) - 02 (0.9m x 1.2m).

Q. No. 4

- A) List the necessary instruments used in plane table surveying. (4)
- B) Define: Back Sight, Fore Sight, Change Point, and Bench Mark. (8)
- OR**
- B) What are the fundamental principles of surveying? Explain briefly. (8)

Q. No. 5

- A) Write the classification of roads according to Nagpur Road Plan. (6)
- B) Draw a neat sketch of a general cross-section of a road. (6)

Q. No. 6

- A) Write a short note on rain water harvesting. (6)
- B) Write the Indian Standard specifications for drinking water. (6)

----- END OF PAPER -----