

TIME ALLOWED: 03 HOURS  
MAXIMUM MARKS: 100  
COURSE: COMPUTER WORKSHOP & PRACTICALS CODE: 160801

SEAT NO. \_\_\_\_\_  
SEMESTER: I  
PROGRAMME: COMPUTER ENGG.

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) Attempt **ALL** questions from Section-I and Section-II.
- (3) Use of Mathematical and Steam tables and pocket calculator (non-programmable) is permissible.
- (4) Illustrate your answers with neat sketches, wherever necessary.
- (5) Figures to the right indicate full marks.
- (6) Assume suitable additional data, if necessary.
- (7) The student should read the name and code of the subject and confirm that the question paper received is as per subject registered.

**SECTION-I**

**Q.1**

**Attempt Any Six of the following**

- (a) Write use of Digital Multi meter.
- (b) Enlist the safety precautions while soldering/ desoldering.
- (c) Draw a well labelled diagram of a typical soldering gun.
- (d) Describe the use of flux in soldering.
- (e) Define printed circuit board (PCB). State its uses.
- (f) Define layout sketch. Write the information on layout sketch of a PCB artwork.
- (g) Write the use of following:  
(i) Capacitor      (ii) Inductor      (iii) Diode

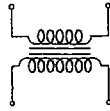
(18)

**Q.2**

**Attempt Any Four of the following**

- (a) Describe the steps involved in Manual cleaning process of a PCB.
- (b) Describe wave soldering in brief.
- (c) Identify symbols of electronic components write use of each one of the following:

(16)



- (d) Describe design rules followed while making PCB.
- (e) Describe dip soldering in brief.
- (f) Write use of following in desoldering  
(i) Vacuum pump      (ii) Copper wire mesh

Q.3

**Attempt Any Two of the following**

(16)

- (a) (i) Find out the value of resistance for following colour bands  
(a) Brown Black Red Silver (b) Yellow Violet Orange Gold  
And write the colour band for following resistors  
(a) 68K  $\Omega$  (b) 447K  $\Omega$
- (b) Describe the steps involved in PCB Making.
- (c) Describe Manual Soldering/Desoldering in detail

Q.4

**Attempt Any Six**

(18)

- (a) List advantages of surface moduled devices (SMD).
- (b) State the types of connectors on mother board.
- (c) Write the safety precaution followed during assembling PC.
- (d) State the function of keyboard controller.
- (e) Describe the function of BIOS.
- (f) Compare between RAM and ROM.
- (g) Explain device driver with example.
- (h) Give the use of Real Time Clock (RTC) on system board.

Q.5

**Attempt Any Four**

(16)

- (a) Explain functions of POST routines.
- (b) Draw and explain electro optical mouse.
- (c) Give the steps involve in resolving hardware compatibility issues with respective display/key board connectors.
- (d) Draw and explain Hard Disk in brief.
- (e) Draw following Display Connectors  
1. VGA 2.HDMI 3.DVI
- (f) Compare SATA with IDE, write use of firewire.

Q.6

**Attempt Any Two**

(16)

- (a) Explain the steps involved in installation of operating system.
- (b) Explain stepwise procedure for assembly and disassembly of computer.
- (c) Describe working of a typical key Board. With suitable diagram.

SEAT NO. \_\_\_\_\_

TIME ALLOWED: 03 HOURS

MAXIMUM MARKS: 100

COURSE: BASIC OF ELECTRICAL ENGINEERING

SEMESTER: II

PROGRAMME: COMPUTER ENGG.

CODE: 160802

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) ALL questions are compulsory.
- (3) Use of Mathematical and Steam tables and pocket calculator (non-programmable) is permissible.
- (4) Illustrate your answers with neat sketches, wherever necessary.
- (5) Figures to the right indicate full marks.
- (6) Assume suitable additional data, if necessary.
- (7) The student should read the name and code of the subject and confirm that the question paper received is as per subject registered.

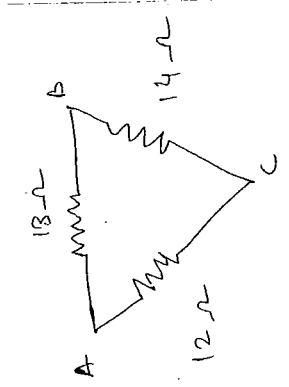
**SECTION-I**

**Q.1. Attempt any Six out of Eight. (18)**

- (a) Find the equivalent resistance when 4 resistors are connected in series and parallel having value  $35\Omega$ .
- (b) Explain curie point.
- (c) State Kirchoff's voltage and current law.
- (d) Define the term-  
Electrical work & electrical energy.
- (e) A resistor of  $25\Omega$  has a potential difference of 75 Vdc across 1 hour, calculate – (i) Power (ii) Energy
- (f) Compare AC and DC supply.
- (g) Explain law of resistance with neat diagram.
- (h) Describe parallel magnetic circuit with neat sketch.

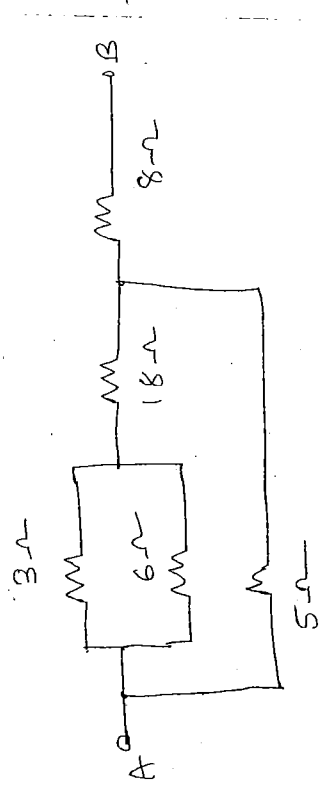
**Q.2. Attempt any Four of Six. (16)**

- a) Obtain star connected equivalent for the delta connected circuit.



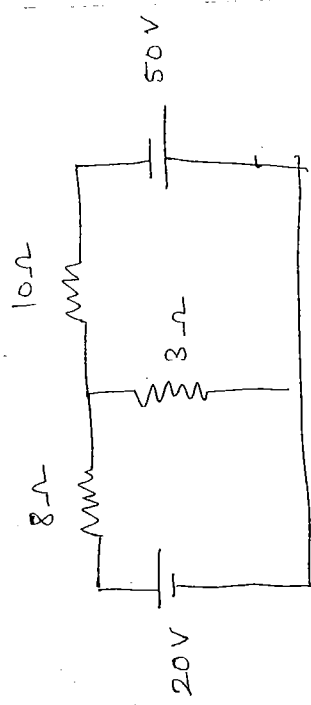
- (b) A certain length of aluminium wire has resistance of  $30\Omega$  at  $25^\circ\text{C}$ . What is the resistance at  $50^\circ\text{C}$ ? The temperature coefficient at aluminium is  $0.00403/^\circ\text{C}$  at  $20^\circ\text{C}$ .

- (c) Explain Wheatstone Bridge with neat diagram.  
 (d) Calculate the equivalent resistance of following.



- (e) Explain in short absolute and relative permeability.  
 (f) Explain the following term-  
 (i) Fuel density (ii) Hysteresis loss (iii) Leakage flux (iv) Reactance

**Q.3.** Attempt any Two out of Three. (16)  
 (a) Write the mesh equations for the given circuit & determine the current.



- (b) Compare electric & magnetic circuit. Also explain how the rise and decay of current in inductive circuits happen.  
 (c) Draw the hysteresis loop & briefly explain about it.

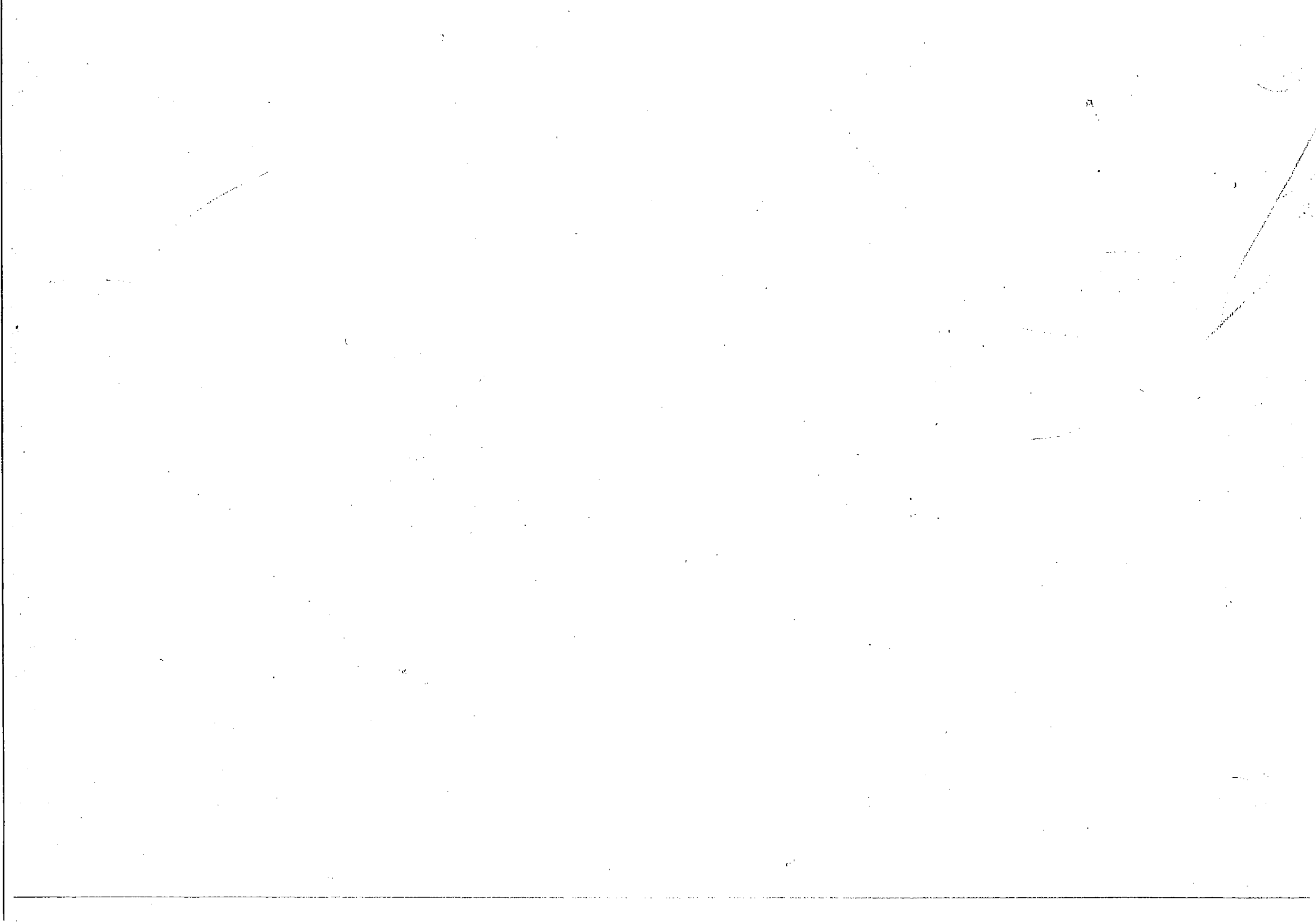
SECTION-II

- Q.4. Attempt any Six out of Eight.** (18)
- Discuss the various factor upon which inductance of a circuit depends.
- Define following terms-
- (i) Peak factor (ii) Form factor (iii) RMS value
- Write short note on AC supply.
- Define the term-
- (i) Coefficient of mutual inductance (ii) AC cycle (iii) Impedance
- Enlist different type of loss in transformer.
- State and explain Faraday's law of electromagnetic induction.
- Discuss the use of KVA rating of transformer.
- Enlist different type of transformer.

- Q.5. Attempt any Four out of Six.** (16)
- Explain self-induced emf in detail.
- Derive emf equation or single phase transformer and explain voltage transformation ratio.
- Define rams value, reactance, and impedance of pure, inductive circuit.
- Compare step-up and step-down transformer.
- Explain pure resistive circuit in AC.
- Explain Fleming's left-hand rule.

- Q.6. Attempt any Two out of Three.** (16)
- Describe the working principle of transformer and write its applications.
- Explain R-L-C AC series circuit in detail.
- Two coil X of 12000 turns and Y of 15000 turns lie in parallel planes such that 60% of the flux produced by coil X links coil Y. A current of SA in coil X produces a flux of 0.05 m wb, while the same current in coil Y produced a flux of 0.075 mwb. Find
- (i) Self-inductance of each coil (ii) Mutual inductance.
- (iii) Coefficient of coupling.

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TIME ALLOWED: 03 HOURS  
MAXIMUM MARKS: 100  
COURSE: ENGINEERING MATHEMATICS

SEAT NO. \_\_\_\_\_  
SEMESTER: I  
PROGRAMME: COMPUTER/INFORM.TECH  
CODE : 168902

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) Attempt all questions each from Section I & Section II.
- (3) Illustrate your answer with neat sketches, wherever necessary.
- (4) Use of Mathematical and Steam tables and pocket calculator (non-programmable) is permissible.
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- (7) Student should read the name and code of the subject and confirm that the question paper received is as per subject registered.

**SECTION-I**

**Q.1**

**Attempt Any Six**

- (a) If  $\log\left(\frac{a+b}{2}\right) = \frac{1}{2} \log a + \frac{1}{2} \log b$  show that  $a = b$  (18)
- (b) Resolve into partial fractions  $\frac{x}{x^2-x-2}$
- (c) Prove that  $\frac{\cos 3\theta}{\cos \theta} + \frac{\sin 3\theta}{\sin \theta} = 4 \cos 2\theta$
- (d) If  $f(x) = x^2 + x + 3$ , find  $f(x+1)$
- (e) If  $Y = f(x) = \frac{x+1}{x-1}$  show that  $f(y) = x$
- (f) Prove that  $7 \log \frac{16}{15} + 5 \log \frac{25}{24} + 3 \log \frac{81}{80} = \log 2$
- (g) Prove that  $2 \cot^{-1}(3) + \cot^{-1}\left(\frac{5}{4}\right) = \frac{\pi}{2}$
- (h) Prove that  $\tan 3\theta = \frac{3 \tan \theta - \tan^3 \theta}{1 - 3 \tan^2 \theta}$

**Q.2**

**Attempt Any Four**

- (a) If A & B are obtuse angles and  $\sin A = \frac{5}{13}$ ,  $\cos B = -\frac{4}{5}$  Find the quadrant of the angle A + B. Also find  $\tan(A+B)$  (16)
- (b) Prove that  $\frac{1}{\log_6 24} + \frac{1}{\log_{12} 24} + \frac{1}{\log_8 24} = 2$
- (c) Resolve into partial fractions  $\frac{x}{2x^2+7x+5}$
- (d) Prove that  $\cos^{-1}\left(\frac{4}{5}\right) + \cos^{-1}\left(\frac{12}{13}\right) = \cos^{-1}\left(\frac{33}{65}\right)$
- (e) Prove that  $\frac{\log_2 5}{2+\log_2 3} = \log_{12} 5$
- (f) If  $f(x) = x^2 - 3x + 4$  find  $f(2x+1)$

**Q.3**

**Attempt Any Two**

- (a) If  $f(x) = x - \frac{1}{x}$  show that  $[f(x)]^3 = f(x^3) - 3f\left(\frac{1}{x}\right)$  (16)
- (b) Prove that  $\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ = \frac{1}{16}$
- (c) Resolve into partial fractions  $\frac{x^2+23x}{(x-3)(x^2+1)}$

**SECTION-II**

**Q.4**

**Any Six out of Eight**

(18)

- (a) Evaluate :  $\lim_{x \rightarrow 4} \frac{x^2 - x - 20}{x + 4}$
- (b) Evaluate :  $\lim_{x \rightarrow 9} \frac{\sqrt{x} - 3}{x - 9}$
- (c) Determine  $\frac{dy}{dx}$ , if  $Y = \frac{x^2 + 5}{x^2 - 6}$
- (d) Find the slope of tangent to  $Y = x^2 + 3x + 5$  at the point  $(-1, 3)$
- (e) Differentiate  $Y = \log\left(\frac{x}{e-x}\right)$  w.r.t.  $x$
- (f) Differentiate :  $x \cos^{-1} x$  w.r.t.  $x$
- (g) If  $x = \frac{1}{y^3}$  find  $\frac{dy}{dx}$
- (h) Evaluate  $\lim_{x \rightarrow \infty} [\sqrt{x^2 + x + 1} - x]$

**Q.5**

**Any Four out of Six**

(16)

- (a) Find the acute angle between the curves  $y = x^3$  &  $x^2 y = 1$  at their point of intersection.
- (b) Discuss the maximum and minimum values of the function  $x^3 - 9x^2 + 24x - 5$
- (c) Find  $\frac{dy}{dx}$ , if  $Y = (\sin x) \tan x$
- (d) Determine  $\frac{dy}{dx}$ , if  $e^x + e^y = e^{x+y}$
- (e) Evaluate  $\lim_{x \rightarrow 0} \left[ \frac{\log(a-x) - \log a}{x} \right]$
- (f) Evaluate  $\lim_{x \rightarrow 0} \left[ \frac{10^x - 2^x - 5^x + 1}{x \tan x} \right]$

**Q.6**

**Any Two out of Three**

(16)

- (a) If  $Y = e^m \sin^{-1} x$  prove that  $(1 - x^2) \frac{d^2 y}{dx^2} - x \frac{dy}{dx} - m^2 y = 0$
- (b) Evaluate :  $\lim_{x \rightarrow -3} \frac{\sqrt{2x+22} - 4}{x+3}$
- (c) If  $x^2 + y^2 + xy - y = 0$ , find  $\frac{dy}{dx}$  at  $(2, 1)$

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Shri Vile Parle Kelavani Mandal's  
**SHRI BHAGUBHAI MAFATLAL POLYTECHNIC**  
AUTONOMOUS SEMESTER EXAMINATION APRIL /MAY, 2018

**TIME ALLOWED: 03 HOURS**  
**MAXIMUM MARKS: 100**  
**COURSE: WEB PROGRAMMING**

**SEAT NO.** \_\_\_\_\_  
**SEMESTER: I/II**  
**PROGRAMME: CSE/IT**  
**CODE: 168905**

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) All questions are compulsory.
- (3) Illustrate your answer with neat sketches, wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Student should read the name and code of the subject and confirm that the question paper received is as per subject registered.

**SECTION-I**

**Q.1**

**Attempt ANY SIX of following.**

- (a) Describe client – server architecture with neat diagram.
- (b) Describe use of following tag with suitable example.
  - i) Bold
  - ii) Italic
  - iii) Underline
- (c) Describe use of img tag with example.
- (d) Explain term frame? Give any two advantages and two disadvantages of frames.
- (e) Compare mark up language and scripting language (Any Three Points)
- (f) Describe various image formats.
- (g) Describe rowspan and colspan attributes with example.
- (h) Give the types of URL and explain term URL.

**(18)**

**Q.2**

**Attempt ANY FOUR of the following.**

- a) Define server? Describe types of server.
- b) Describe following. i) Search engine ii) Structure tags
- c) Describe image maps with suitable example.
- d) Describe formatting of tables with example.
- e) Describe FRAMESET TAG with example.
- f) Describe ordered and unordered list with example.

**(16)**

**Q.3**

**Attempt ANY TWO of the following.**

- a) Describe Frame tag. Give use of following attribute.
  - i) Name
  - ii) Frame border
  - iii) Margin height
  - iv) Margin width
  - v) resize
  - vi) scrolling
- b) Explain following terms and give its functions.
  - i) Server side coding
  - ii) client side coding
- c) Write HTML code for following output

**(16)**

| ROLL NO | NAME  | PERCENTAGE |
|---------|-------|------------|
| 01      | JACK  | 63%        |
| 02      | JOHN  | 56%        |
| 03      | STEVE | 78%        |
| 04      | SMITH | 62%        |

## SECTION-II

**Q.4**

**Attempt ANY SIX of the following**

(18)

- a) Give the difference between GET & POST method.
- b) Define function in java script.
- c) List the advantages of stylesheets?
- d) Define animation, explain briefly GIF animation.
- e) Enlist the type selector? Explain any one.
- f) Explain the significance of “action” attribute and “target” attribute.
- g) Explain the attributes of radio button.
- h) Give the advantages & disadvantage of GIF in animation.

**Q.5**

**Attempt ANY FOUR of the following**

(16)

- a) Explain the components of CSS with an example.
- b) Describe DOM structure hierarchy.
- c) Explain image mapping with an example.
- d) Explain cell spacing and cell padding attribute with example.
- e) Write a program by taking user name as input and display user name in alert box.
- f) Explain the following methods w.r. to Java script.
  - i) ON MOUSEUP
  - ii) ON BLUR

**Q.6**

**Attempt ANY TWO of the following**

(16)

- a) Describe the steps to create an animated GIF with fading effects.
- b) Create a registration form for college sports competition as shown below.

|                                       |                                      |
|---------------------------------------|--------------------------------------|
| Name of student                       | <input type="text"/>                 |
| Roll no                               | <input type="text"/>                 |
| Year (Pull-down Menu)                 |                                      |
| Gender (Radio Button)                 |                                      |
| Event interested in                   |                                      |
| Indoor games (check box)              |                                      |
| Outdoor games (check box)             |                                      |
| <input type="button" value="Submit"/> | <input type="button" value="Reset"/> |
| ↑<br>button                           | ↑<br>button                          |

- c) Write a java script program by taking user input and perform addition.

TIME ALLOWED: 03 HOURS  
MAXIMUM MARKS: 100  
COURSE: APPLIED MATHEMATICS

SEAT NO. \_\_\_\_\_  
SEMESTER: II  
PROGRAMME: CSE/IT  
CODE: 168907

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) All Questions are compulsory.
- (3) Illustrate your answer with neat sketches, wherever necessary.
- (4) Use of Mathematical and Steam tables and pocket calculator (non-programmable) is permissible.
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- (6) Assume suitable additional data, if necessary.
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**SECTION-I**

**Q.1**

**Solve Any Six**

(18)

- (a) Find 'x' if  $\begin{vmatrix} x & 4 & -4 \\ 3 & -2 & 1 \\ -2 & -4 & 4 \end{vmatrix} = 0$
- (b) If  $A = \begin{bmatrix} 1 & -5 \\ 6 & 4 \end{bmatrix}$ ,  $B = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$  find the matrix  $AB - 2I$ .
- (c) The distance between the points (5, -3) and (x,1) is 5 units. Find x.
- (d) Show that the lines  $2x + 3y - 1 = 0$  and  $3x - 2y + 6 = 0$  and  $3x - 2y + 6 = 0$  are perpendicular.
- (e) Find the centre and radius of the circle  $x^2 + y^2 - 8x - 6y + 24 = 0$ .
- (f) Find the value of determinant by the expansion  $\begin{vmatrix} 2 & -1 & 3 \\ 1 & 3 & -4 \\ 5 & -5 & 4 \end{vmatrix}$
- (g) If  $A = \begin{bmatrix} 2 & 4 \\ -1 & -2 \end{bmatrix}$  show that  $A^2$  is a null matrix.
- (h) Find the equation of the circle with centre at (2, -7) and radius  $\sqrt{2}$  units.

**Q.2**

**Solve Any Four**

(16)

- (a) The three vertices of rectangles are (2, -2), (8, -4) and (5, 7). Find the fourth vertex.
- (b) Find the acute angle between the lines  $3x - 2y + 4 = 0$  and  $2x - 3y - 7 = 0$
- (c) If  $A = \begin{bmatrix} 2 & -2 \\ 3 & 1 \end{bmatrix}$ ,  $B = \begin{bmatrix} -1 & 5 \\ 4 & -3 \end{bmatrix}$ ,  $C = \begin{bmatrix} 7 & -5 \\ 0 & 5 \end{bmatrix}$  verify that  $(AB)_c = A (BC)$
- (d) Determine which of the two circle is greater  $x^2 + y^2 - 3x + 4y = 0$  and  $x^2 + y^2 - 6x + 8y = 0$
- (e) If  $A = \begin{vmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{vmatrix}$  show that  $A^2 = A$
- (f) Find the area of the triangle whose vertices are (-1,5) (3, 1) and (5, 7).

**Q.3**

**Solve Any Two**

(16)

(a) The voltage in an electric circuit are related by the following equation

$$V_1 + V_2 + V_3 = 9 \quad V_1 - V_2 + V_3 = 3 \quad V_1 + V_2 - V_3 = 1$$

Solve the above equation using Cramer's rule and find the value of  $V_1$ ,  $V_2$  and  $V_3$ .

(b) Find the inverse of the co-efficient matrix of the equation.

$$2x + 3y - Z + 3 = 0 \quad 5x + y + 3z = 10$$

$4x + 3y - 2z + 3 = 0$  and hence solve them

(c) Find the equation of a tangent and normal to the circle  $X^2 + Y^2 + 6x - 6y - 7 = 0$  at  $(0, 7)$

**SECTION-II**

**Q.4**

**Any Six out of Eight (3 marks each)**

(18)

(a) Evaluate :  $\int \frac{x+1}{\sqrt{x-2}} dx$

(b) Integrate w.r.t x six<sup>2</sup> x Cos<sup>2</sup> x

(c) Evaluate:  $\int \frac{dx}{\sqrt{3-4x-2x^2}}$

(d) Express in the form of x +iy :  $\frac{2i^2-3i^7+4i^6+2}{3i^2-4i^5+4}$

(e) If  $Z_1 = 6 - 2i$ ,  $Z_2 = 2 - 5i$ ; Find  $|ZZ_1 - 3Z_2|$  and  $|Z_1Z_2|$

(f) Find Modulus and amplitude of  $1 - i\sqrt{3}$ . Hence write it in polar form.

(g) If  $\vec{a} = 3\vec{i} - 2\vec{j} + 2\vec{k}$ ,  $\vec{b} = 6\vec{i} + 4\vec{j} - 2\vec{k}$ ,  $\vec{c} = 3\vec{i} + 2\vec{j} + 4\vec{k}$  Find  $\vec{a} \times (\vec{b} \times \vec{c})$

(h) If  $|\vec{a} + \vec{b}| = |\vec{a} - \vec{b}|$  Prove that  $\vec{a}$  and  $\vec{b}$  are perpendicular

**Q.5**

**Any Four out of Six (4 marks each)**

(16)

(a) Simplify using De Meivre's Theorem  $\frac{(\cos 2\theta + i \sin 2\theta)^3 (\cos 3\theta - i \sin 3\theta)^4}{(\cos \theta + i \sin \theta)^2 (\cos 2\theta - i \sin 2\theta)^{-3}}$

(b) Evaluate  $\int x^2 \tan^{-1} x dx$

(c) Evaluate  $\int \frac{dx}{(x^2+4)(x+1)}$

(d) If  $\vec{a} = 3\vec{i} + \vec{j} - 2\vec{k}$  and  $\vec{b} = \vec{i} - 3\vec{j} + 4\vec{k}$  Find  $\vec{a} \cdot \vec{b}$  and  $\vec{a} \times \vec{b}$

(e) Evaluate  $\int_0^{\pi/2} \frac{dx}{1 + \sqrt{\tan x}}$

(f) Find the sine of the angle between the vectors  $3\vec{i} - 2\vec{j} + 4\vec{k}$  and  $6\vec{i} + 3\vec{j} + \vec{k}$

**Q.6**

**Any Two out of Three (8 marks each)**

(16)

(a) (i) Using Euler's formula prove that  $\sin 2\theta = 2 \sin \theta \cos \theta$

(ii) Two points A (1, 4) and B (9, 12) are on the parabola  $Y^2 = 16x$ . Show that the area enclosed between the Chord AB and the parabola is  $\frac{16}{3}$  Sq. units.

(b) Evaluate :  $\int_0^{\pi} \frac{x \sin x}{1 + \cos^2 x} dx$

(c) (i) A force of magnitude 3 units in the direction of  $2\vec{i} + 3\vec{j} + 6\vec{k}$  acts at (1,1,1). Find its moment about the point (-1,2,3)

(ii) Prove that  $(1+i)^8 + (1-i)^8 = 32$

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Shri Vile Parle Kelavani Mandal's  
**SHRI BHAGUBHAI MAFATLAL POLYTECHNIC**  
**AUTONOMOUS SEMESTER EXAMINATION APRIL/MAY - 2018**

TIME ALLOWED: 03 HOURS  
MAXIMUM MARKS: 100  
COURSE: ELECTRONIC DEVICES & CIRCUITS  
SEAT NO.  
SEMESTER: VII  
PROGRAMME: IT/ CSE  
CODE: 168908

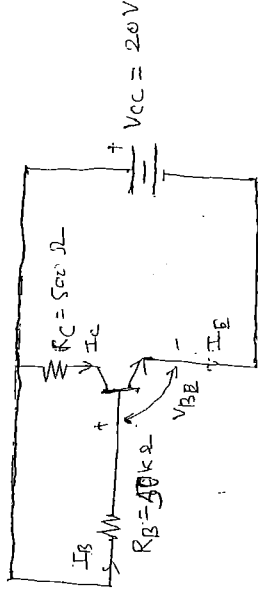
**INSTRUCTIONS:**

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- (2) Attempt ALL Questions from Section I & Section II.
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**SECTION-I**

- Q.1 Attempt Any Six of following. (18)**
- (a) Define current gain in common Base and common Emitter configuration of transistor and find relation between them.
  - (b) Draw energy level diagram of semiconductor. Define donor and acceptor levels.
  - (c) Define following terms:
    - (i) Peak inverse voltage
    - (ii) Potential barrier
    - (iii) Depletion regions
  - (d) Draw circuit of  $\Pi$  filter and briefly explain its working.
  - (e) Define following terms : (i) Ripple factor (ii) Efficiency  
(iii) Transformer utilisation factor (TUF)
  - (f) Define P-type and N-type semiconductor material, define minority and majority charge carriers.
  - (g) Compare between half wave and full wave rectifier.
  - (h) Explain process of formation of potential barrier and PN junction.
- Q.2 Attempt Any Four of following. (16)**
- (a) Draw V.I. characteristics of P.N. Junction explain forward and reverse biasing.
  - (b) Compare between different configurations of transistor.

- (c) Determine the Q point of transistor circuit shown in below fig. The transistor has  $\beta = 150$  and  $V_{BE} = 0.7V$



$R_B = 50k\Omega$ ,  $R_C = 500\Omega$ ,  $V_{CC} = 20V$

- (d) Define DC load line and operating point, explain its significance.  
 (e) Explain need of rectifier and filters. Draw half wave rectifier circuit.  
 (f) Derive the relationship between  $\alpha$ ,  $\beta$  and  $r$  current gain at CB, CE and CC configuration.

### Q.3

Attempt Any Two of following.

(16)

- (a) Enlist the Regions on output characteristics of CE configuration. Draw input and output characteristic of CE configuration and explain.  
 (b) Draw Bridge full wave rectifier circuit, it's waveforms and explain it's working.  
 (c) Explain Zener diode As voltage regulator with help of example and diagram.

### SECTION-II

### Q.4

Answer any Six of following.

(18)

- (a) Discuss the term Thermal runaway with respect to power amplifier.  
 (b) State and explain the classifications of power amplifiers.  
 (c) Draw CE amplifier circuit diagram and explain function of each component.  
 (d) Sketch a neat diagram of Schmitt trigger with it's waveforms.  
 (e) Enlist the types of photo electric devices.  
 (f) Draw a diagram of photo multiplier tube and give it's applications.  
 (g) List the application of multivibrators.

- (h) Explain the effect of cascading in amplifier stages on  
(i) Bandwidth (ii) gain (AV)

**Q.5 Answer Any Four of following.**

(16)

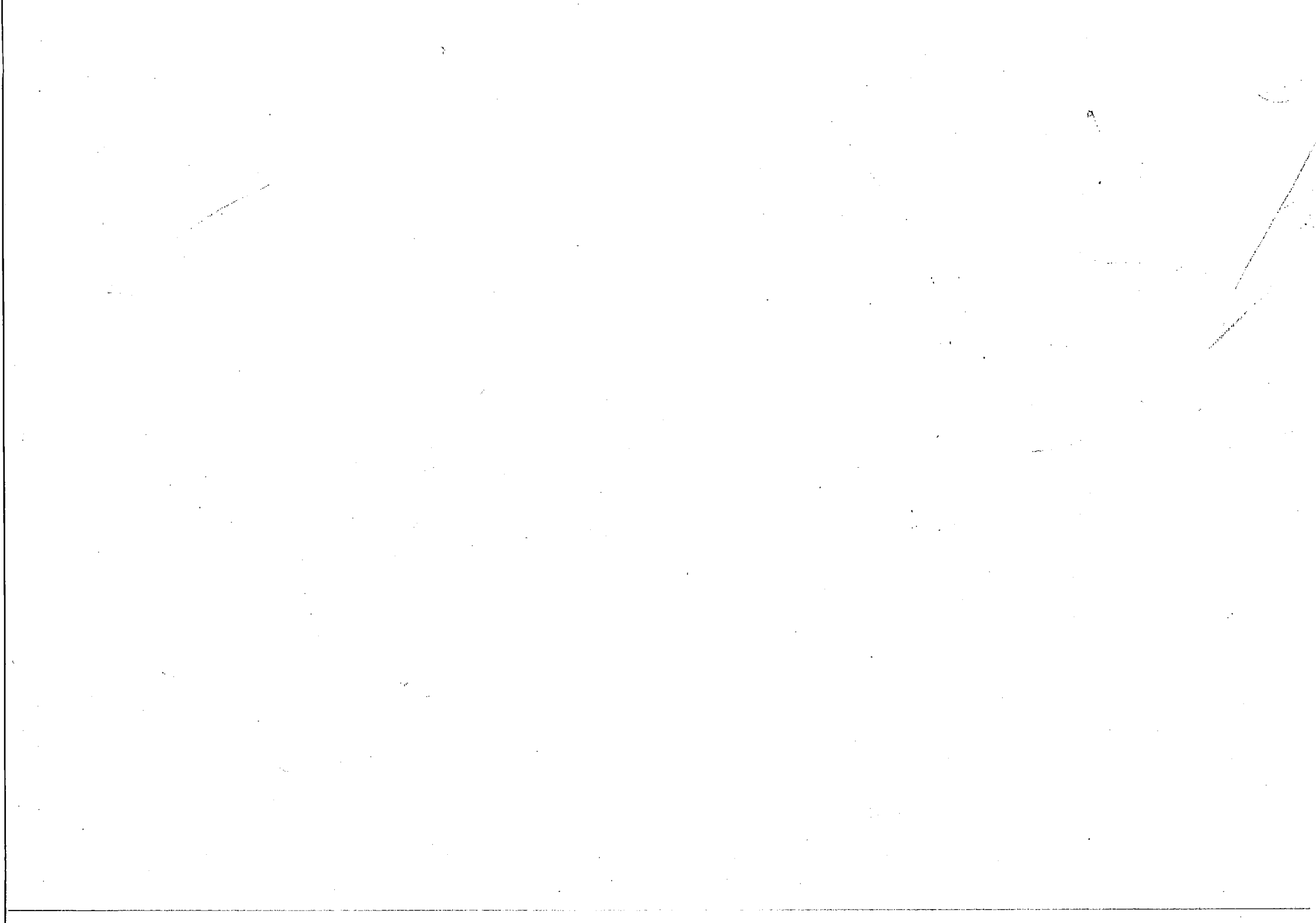
- (a) Explain the functions of transistor as an amplifier.
- (b) Sketch a circuit diagram of class A transformer coupled power amplifier and explain it.
- (c) State need of multistage amplifier and give the types of coupling used to design multistage amplifier.
- (d) Compare different types of multivibrators.
- (e) Explain the operation of photo transistor with its characteristics.
- (f) With the help of neat diagram and waveform explain the operation of Bistable multivibrator.

**Q.6 Answer Any Two of following.**

(16)

- (a) With a neat circuit diagram and frequency response explain the operation of RC coupled amplifier.
- (b) Explain the construction and operation of LED.
- (c) With a neat sketch explain the operation of complementary symmetry power amplifier.

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Shri Vile Parle Kelavani Mandal's

**SHRI BHAGUBHAI MAFATLAL POLYTECHNIC**  
**AUTONOMOUS SEMESTER EXAMINATION APRIL/MAY - 2018**

SEAT NO. \_\_\_\_\_

TIME ALLOWED: 03 HOURS

SEMESTER: II

MAXIMUM MARKS: 100

PROGRAMME: Computer Engg.

COURSE: Programming In C

CODE: 168909

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) Attempt all questions.
- (3) Illustrate your answer with neat sketches, wherever necessary.
- (4) Use of Mathematical and Steam tables and pocket calculator (non-prog.) is permissible.
- (5) Figures to the right indicate full marks.
- (6) Assume suitable additional data, if necessary.
- (7) Student should read the name and code of the subject and confirm that the question paper received is as per subject registered.

**SECTION-I**

Q.1

**Attempt ANY SIX of following.**

(18)

- a) Draw a flowchart to find area of rectangle.
- b) List any six keywords in C.
- c) Define the following: (i) Keyword (ii) Variable (iii) Constant
- d) Explain conditional operator with syntax & example.
- e) State different data types supported by C.
- f) State use and syntax of printf ( ) and scanf ( )
- g) Differentiate between do while & while loop.
- h) State use of break and continue statement.

Q.2

**Attempt ANY FOUR of following**

(16)

- a) Define algorithm and write an algorithm to accept marks of five subjects and find average.
- b) Write a program to enter basic salary. Calculate gross salary with 5% DA and 15 % TA on basic salary. Display calculated gross salary.
- c) Explain arithmetic and logical operators of C with their use.
- d) State the use of increment and decrement operators. Also give difference between i++ and ++i statement with example.
- e) Two numbers are input through the keyboard into two locations. Write a program to interchange contents of those two locations.
- f) Write a program in C to find whether given number is prime or not.

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168909

Q.3

**Attempt ANY TWO of following**

(16)

- a) Write a menu driven program for following.
- To find whether entered number is even or odd
  - To display sum of two entered numbers
- b) Write a program to display series of 11 to 30 in ascending and descending order.  
Also calculate sum of 11 to 30.
- c) Debug following program and write only errors if any

```
i) # include <stdio.h>
main ()
{
    char x ;
    while (x = 0; x <= 255; x++)
        Printf (“\n character is % c”, X);
}
ii) # include <stdio.h>
void main ()
{
    int suite = 0;
    switch (suite)
    {
        case 0; printf(“club”)
        case 1; printf(“Diamond”);
    }
}
```

**SECTION-II**

Q.4 **Solve ANY SIX out of EIGHT**

(18)

- What is pointer? Enlist the benefits of using pointer?
- Enlist different string handling functions & explain anyone using suitable example.
- Describe the limitation of get char () & scanf () functions for reading the string.
- Explain the use of following pointer operator : (i) & (ii) \*
- How to declare & initialize character array?
- Differentiate structure & Union.
- Write a program to print reverse of string without using string handling function.
- Write a program to scan & print elements of 2 dimensional matrix.

Q.5

**Solve ANY FOUR out of SIX**

(16)

- (1) Explain "Nesting of Functions" using suitable example.
- (2) Write a program using function to search a given number from the list of 5 numbers. Print proper message for number found / not found (Note : scan the numbers from users)
- (3) Explain following structure concepts:
  - (i) Defining structure
  - (ii) Declaring initialization
  - (iii) Structure initialization
  - (iv) Accessing structure members
- (4) Using suitable example, explain "pointers as function argument".
- (5) Write a program to perform following operation:  $C = A+B$  where A, B, & C are one-dimensional array.
- (6) Write a program to demonstrate the concept of call by reference.

Q.6

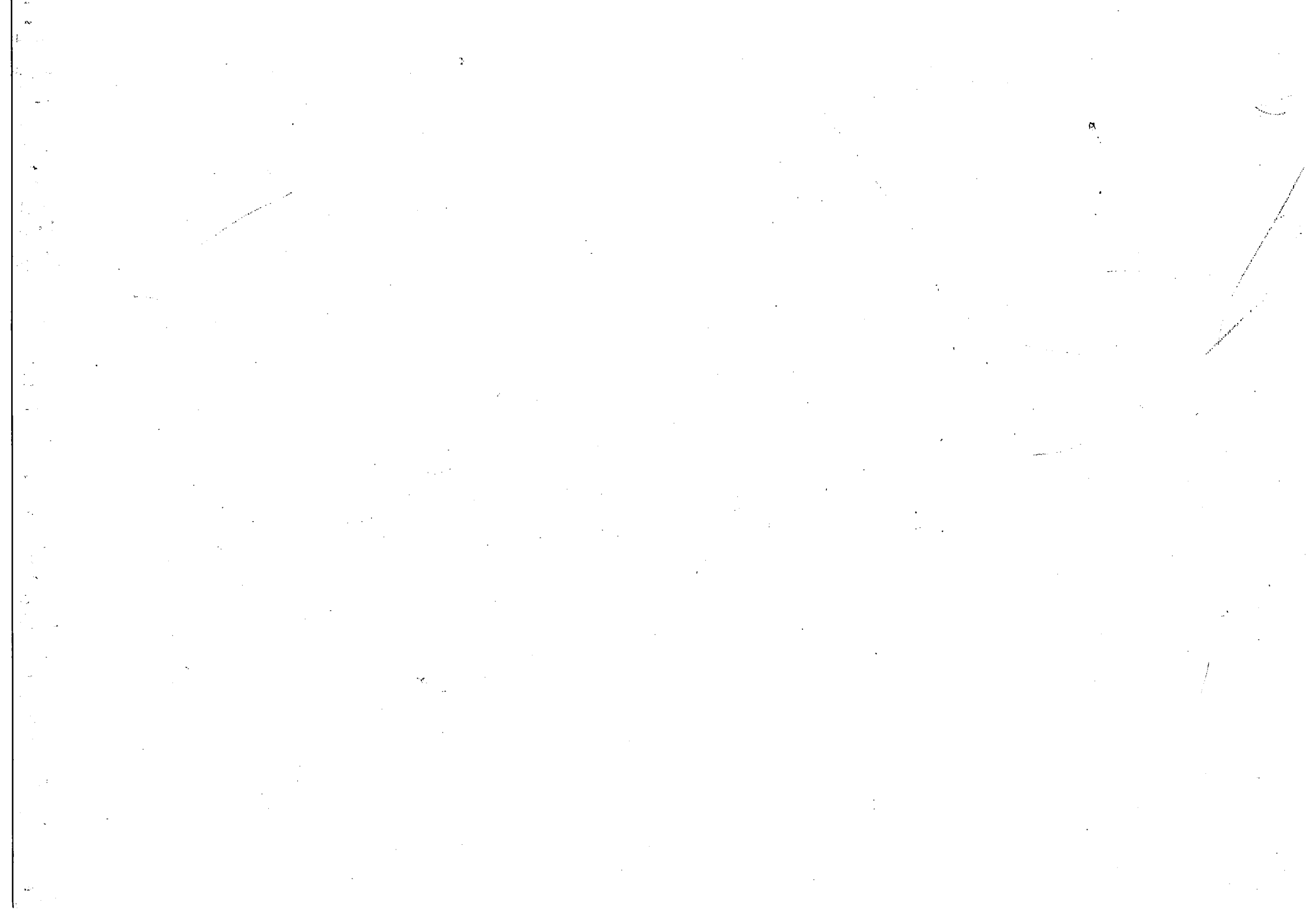
**Solve ANY TWO out of SIX**

(16)

- (1) Define the term Recursion. Write a 'c' program to calculate factorial of a number using recursion and explain the steps of execution.
- (2) Enlist different categories of function. Explain any two with suitable example programs.
- (3) Write a 'C' program using array of structure to scan employee information like name, employee number, salary for 3 employees & display the information.

B/B

168909



**SHRI BHAGUBHAI MAFATLAL POLYTECHNIC**  
**AUTONOMOUS SEMESTER EXAMINATION APRIL/MAY-2018**

TIME ALLOWED: 03 HOURS SEAT NO. \_\_\_\_\_  
MAXIMUM MARKS: 100 SEMESTER: I / II  
COURSE: COMMUNICATION SKILLS CODE: 168910 PROGRAMME: COMPUTER/INFORM.TECH.

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) Attempt **ALL** questions from Section-I and Section-II.
- (3) All questions are compulsory.
- (4) Illustrate your answers with neat sketches, wherever necessary.
- (5) Use of Mathematical and Steam tables and pocket calculator (non-programmable) is permissible.
- (6) Figures to the right indicate full marks.
- (7) Assume suitable additional data, if necessary.

**SECTION-I**

- Q.1 Solve Any Six of the following questions (18)**
- (a) Define Feedback. Enlist types of Feedback.
  - (b) Discuss any two objectives of Communication.
  - (c) Give advantages and disadvantages of oral communication.
  - (d) What are physical barriers? Enlist types of physical barriers.
  - (e) Explain the upward communication network.
  - (f) Explain the role of 'silence' in effective communication.
  - (g) 'Good Communication is good business' Explain.
  - (h) Explain Netiquettes.
- Q.2 Attempt Any Four of the following questions (16)**
- (a) What is communication? Discuss cycle of communication.
  - (b) Discuss the downward and grapevine communication.
  - (c) Mark the stress in the following words:  
(i) Fuse box (ii) maintain (iii) Referee (iv) Mercy
  - (d) Explain eye contact, gestures and smile.
  - (e) Do as Directed:  
(i) If you require any further information. Please contact me.(Rewrite using 'should')  
(ii) I was doing my homework. He came to meet me.(Rewrite using 'when')  
(iii) He works really hard (Rewrite in the present perfect tense)  
(iv) When I was in the college. I would visit the library regularly (Rewrite using 'used to')
  - (f) Explain in brief horizontal or lateral network.
- Q.3 Attempt Any Two of the following questions: (16)**
- (a) Discuss linguistic and socio-cultural barriers.
  - (b) What is no-verbal communication? Discuss its features and importance.
  - (c) Write a paragraph on any one of the following:

- (i) 07 April : Worlds Health Day
- (ii) 12 January : National Youth Day
- (iii) Make in India

**SECTION-II**

**Q.4**

**Answer Any Three out of Five**

(18)

- (a) Grapevine as a means of communication.
- (b) What are the 7Cs of good writing?
- (c) Explain the internet as a means of communication.
- (d) Explain the cycle of communication.
- (e) What is technical jargon? Explain with examples.

**Q.5**

**Answer Any four out of Six**

(16)

- (a) Write a note on the types of reports.
- (b) What are linguistic barriers?
- (c) Explain Netiquettes.
- (d) Write a letter to Hazlite Stationary & Co. enquiring about the terms of business for the purchase of exquisite stationary for your employees.
- (e) Write a letter of complaint to Laxmi Engineering Works on the issue of faulty Machinery delivered to your Company
- (f) Write a letter to the Editor of outlook magazine on your views regarding the pros and cons of online shopping.

**Q.6**

**Answer Any Two out of Three**

(16)

- (A) Read the following comprehensions and answer the questions given below passage:
  - (a) In the passage, 'autism 'is described as : (01)
  - (b) (i) a disease (ii) a physical handicap (iii) brain disorder (iv) Sleep disorder (01)  
What is the central characteristic that distinguishes an autistic child from a normal child?
  - (c) Who are 'sanants'? Do they read normal lines? Quote a sentence from the passage in support of your answer. (01)
  - (d) What are some of the reasons for violent behaviour in autistic children? (01)
  - (e) What are the 'sonsoy' difficulties faced by autistic children? Explain with an example from the passage. (01)
  - (f) How does Temple Grandin describes herself ? Why ? (01)
  - (g) Write the verb form of : (01)
  - (i) Interaction (ii) Communication (ii) Conversation (iv) Perception (01)
  - (h) Find the opposites of the given words for the passage (01)  
(i) Ability (ii) Competent

**Para on separate page No.3**

Autism Spectrum Disorder is a complex, lifelong disorder of brain development marked by difficulties in social interaction, verbal and non-verbal communication and repetitive behaviours. Simply put, the individual has difficulty in understanding the rules of social behaviour that most of us seem to learn very naturally through observation and imitation and just being part of a social group. For example, a typically developing four year old knows perfectly well that she is not supposed to snatch a toffee from her two year old sibling. Even if she does so, she will probably cast a furtive glance towards her mother fully expecting a frown or a scolding. Understanding the mental states of other and orienting our own behaviour accordingly denotes what psychologists call a 'theory of mind'. It is this fundamental difficulty in social understanding that characterizes the autistic condition. Autism is a 'spectrum' disorder whose severity and intensity is highly variable. Some individuals may be so mildly affected that they may pass off in society as being merely odd or eccentric; others may have such severe difficulties that they may require care all their lives. There is a widespread belief that people with autism have extraordinary talents in areas like music or math, a perception reinforced by popular films and fiction, but these 'savants', as they are termed, form a minuscule percentage of the autistic population. Despite the extraordinary abilities in certain areas, they may have great difficulties in functioning in other aspects of daily life like going to the store to buy a loaf of bread or making polite conversation.

One of the early 'warning signs' that a child may have autism is delayed speech or development of speech patterns that are not 'meaningful' in nature. For instance, in the case of R, we saw that the child could recite rhymes and jingles. But he could not tell his parents when he felt hungry or thirsty or respond to their speech meaningfully. Due to their inability to make themselves understood and difficulties in communicating, children with autism may often throw temper tantrums, scream, cry, hit out at others or even engage in self injurious behaviour like head banging, hand biting etc. The child is assumed to be a 'spoilt brat' and the parents as over-indulgent or incompetent. The reality, of course is quite different.

People with autism also experience 'sensory difficulties' owing to their neurological problem. In other words, because they are 'wired' differently, they may experience very different reactions to sensory stimuli like touch, heat or cold, sounds, smells etc. Many children hate being held or cuddled, others relish it. A child I know can 'hear' the sound of an approaching airplane half a minute before anyone else. And one child is so terrified at the sound of bursting crackers, that his family has to retreat to the quiet of the hills each Diwali! The combination of communication and sensory difficulties and the inability of people around them, to understand how chaotic and confusing 'our' world may appear to them, have been beautifully summed up by Temple Grandin, a very able and successful woman with autism. 'An Anthropologist on Mars', is how she describes herself!

- (B) Paragraph writing (08)  
(i) Online shopping (ii) Corruption  
(C) Write an investigation report on causes of students absenteeism in festive days. (08)





Shri Vile Parle Kelavani Mandal's  
SHRI BHAGUBHAI MAFATLAL POLYTECHNIC  
AUTONOMOUS SEMESTER EXAMINATION APRIL/MAY 2018

TIME ALLOWED: 03 HOURS  
MAXIMUM MARKS: 100

SEAT NO. \_\_\_\_\_  
SEMESTER: III / II  
PROGRAMME: CSE/IT

COURSE: Digital Electronics

CODE: 168912

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) All questions are compulsory.
- (3) Illustrate your answer with neat sketches, wherever necessary.
- (4) Use of pocket calculator (non-programmable) is permissible.
- (5) Figures to the right indicate full marks.
- (6) Assume suitable additional data, if necessary.
- (7) Student should read the name and code of the subject and confirm that the question paper received is as per subject registered.

**SECTION-I**

**Q.1**

**Attempt ANY SIX**

**(18)**

- a) Perform multiplication  $(01111111)_2$  by  $(00000101)_2$
- b) Find 2's complement of  $(01100111)_2$
- c) Define & give example Odd parity & Even parity.
- d) Classify the logic families.
- e) State commutative & associative law.
- f) Draw the circuit diagram of half adder using basic logic gates.
- g) Illustrate with examples
  - i) Binary to Grey Converter
  - ii) Grey to Binary Converter
- h) List the applications of multiplexers.

**Q.2**

**Attempt any Four**

**(16)**

- a) Compare CMOS & TTL logic families.
- b) Perform using 2's complement method.
  - i)  $48 - 23$
  - ii)  $23 - 12$
- c) Minimize using K map and realize it using the basic gates.  
 $Y = \sum m(1,3,5,9,11,13) + d(2,4)$
- d) Discuss 7 bit hamming code with example.
- e) Enlist the I/p & O/p parameters of logic families.
- f) Draw & Explain along with the truth table 1 : 4 demultiplexer.

**Q.3**

**Attempt any two**

**(16)**

- a) i) Draw full adder using two half adder  
ii) State De Morgan's theorem using truth table.
- b) Design 16:1 multiplexer using 4:1 multiplexers. Describe the working.
- c) With a neat diagram explain the function of TTL Nand gate.

**SECTION – II**

- Q.4** **Solve ANY SIX** **(18)**
- 1) Define FLIP FLOP. Write its applications.
  - 2) Compare FLIP FLOP and registers. Give classification of register.
  - 3) Draw S.R. FLIP FLOP. Write its truth table.
  - 4) Briefly explain various modes of shift register.
  - 5) Define counters and its types.
  - 6) Explain the memories based on physical characteristics.
  - 7) Draw 3 bit Asynchronous down counter
  - 8) List application of IC 555 time.

- Q.5** **Solve ANY FOUR** **(16)**
- 1) Draw the circuit of J.K. flip, write its truth table and define race around condition.
  - 2) With neat diagram explain the operation of 4 bit parallel in serial out register.
  - 3) Compare static and dynamic RAM.
  - 4) Draw IC555 timer as monostable multivibrator. Draw and explain waveform.
  - 5) Explain with diagram 3 bit ring counter using D Flip Flop.
  - 6) Design T Flip Flop, write its truth table. Compare it with D flip flop.

- Q.6** **Solve any two** **(16)**
- i) Discuss MS JK flipflop with waveform and truth table explain how race around condition is avoided.
  - ii) Draw and explain block diagram of IC555 timer.
  - iii) Draw and Explain 4 bit bidirectional shift register.

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**Shri Vile Parle Kelavani Mandal's**  
**SHRI BHAGUBHAI MAFATLAL POLYTECHNIC**  
**AUTONOMOUS SEMESTER EXAMINATION APRIL / MAY 2018**

SEAT NO. \_\_\_\_\_  
SEMESTER: **III**  
PROGRAMME: **IT**

**TIME ALLOWED: 03 HOURS**  
**MAXIMUM MARKS: 100**

**COURSE: SYSTEM PROGRAMMING**      **CODE: 168913**

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) All questions are compulsory.
- (3) Illustrate your answer with neat sketches, wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Student should read the name and code of the subject and confirm that the question paper received is as per subject registered.

**SECTION-I**

**Q.1**      Solve Any SIX out of Eight (3 marks each)      **(18)**

1. Differentiate between multiprocessing and multiprogramming.
2. Enlist the functions performed by operating system.
3. Explain with example how physical address is calculated to access the data.
4. Explain an 'Instruction' with example.
5. List the functions of Macros.
6. List the functions of Assembler.
7. Describe BALR and BCT instruction using example.
8. Perform shell sort on the following set of data :  
22, 10, 03, 27, 18, 01

**Q.2**      Answer ANY FOUR out of SIX (Four Marks each)      **(16)**

1. List the components of system programming. Explain any one in brief.
2. Explain ANY TWO instruction format used in IBM 360/370.
3. Explain with the help of an example address modification using instruction as data.

4. Draw micro flowchart for IBM 360 'ADD' instruction.

5. Explain address calculation sort for the following data :

22, 19, 01, 04, 35, 18

6. Explain 'Macro' and its expansion with an example.

**Q.3**      Answer ANY TWO out of THREE (Eight marks each)      **(16)**

1. Draw general machine structure and explain how the components work.

2. Draw the Pass1 and Pass2 flowchart of Macros.

3. Draw and explain the databases required in Pass1 and Pass2 Assemblers.

**SECTION-II**

**Q.4**

ANY SIX out of EIGHT (THREE marks each)

**(18)**

- a) Explain use of ESD, TXT, RLD cards used in loader.
- b) Give importance of HLL?
- c) Explain dynamic loading.
- d) What is storage assignment in compilers general model?
- e) Explain the term Relocating loader.
- f) Describe overlay structure?
- g) State the advantages of P-code compiler?
- e) Give advantages of HLL over assembly language?

**Q.5**

ANY FOUR out of SIX (FOUR marks each)

**(16)**

- a) Explain Dynamic linking with example.
- b) Describe function of interpretation phase of compiler.
- c) Explain compile and go loader & disadvantages of it.
- d) Describe extensive data types in HLL.
- e) Define transfer vector & relocation bit.
- f) Explain 'Asynchronous Operation'.

**Q.6**

ANY TWO out THREE (EIGHT marks each)

**(16)**

- 1) Explain lexical phase? Syntax phase in compilation process.
- 2) Explain absolute loader with design.
- 3) Discuss function modularity & flexibility in HLL.

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**SHRI BHAGUBHAI MAFATLAL POLYTECHNIC**  
**AUTONOMOUS SEMESTER EXAMINATION APRIL/MAY- 2018**

SEAT NO. \_\_\_\_\_

TIME ALLOWED: 03 HOURS

MAXIMUM MARKS: 100

COURSE: PROGRAMMING IN C ++

SEMESTER: III

PROGRAMME: COMPUTER ENGG.

CODE: 168914

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) Attempt **ALL** Questions from Section I & Section II.
- (3) Illustrate your answer with neat sketches, wherever necessary.
- (4) Use of Mathematical and Steam tables and pocket calculator (non-programmable) is permissible.
- (5) Figures to the right indicate full marks.
- (6) Assume suitable additional data, if necessary.
- (7) Student should read the name and code of the subject and confirm that the question paper received is as per subject registered.

**SECTION-I**

**Q.1**

**Attempt Any Six out of Eight**

**(18)**

- (a) Discuss the advantages and disadvantages of inline function.
- (b) Distinguish between objects and classes.
- (c) Define destructor with an example.
- (d) Explain conditional operator using example.
- (e) Compare break and continue statement.
- (f) Explain how the data and functions are organised in oops?
- (g) State the characteristics of procedure oriented programming.
- (h) Define keyword. Give the list of keywords in C++

**Q.2**

**Attempt Any Four out of Six**

**(16)**

- (a) Enlist the types of constructors and explain parameterized constructor with example.
- (b) Explain the role of static member function in oop with suitable example.
- (c) Describe type conversion with suitable example.
- (d) Explain the use of array of objects in C++
- (e) Discuss function overloading with its syntax.
- (f) Explain the concept of objects as function argument with suitable example.

**Q.3**

**Attempt Any Two out of Three**

**(16)**

- (a) Explain concept of (i) Call by value (ii) Call by reference Using suitable example.
- (b) Write a C++ programme to define class employee having empid, empname and basic salary as class members. Read the data of five employees and display employee details of employee having basic salary > 5000.
- (c) Write a programme to find the square of a given number and the square of the sum of given three numbers by using function overloading.

## SECTION-II

**Q.4** **Answer Any Six** (18)

- (a) Write steps involved in overloading of operator.
- (b) Write a C++ program to find the length of entered string using pointer.
- (c) Explain abstract class with suitable example.
- (d) What is static member function? How is it declared?
- (e) State the difference between Macro and Inline function.
- (f) Explain friend function with suitable example.
- (g) What is virtual base class? Describe with suitable example.
- (h) State any two types of memory allocation in detail with example.

**Q.5** **Attempt Any Four** (16)

- (a) Explain generic function using suitable example
- (b) Draw and explain multiple inheritance with suitable example.
- (c) Explain relationship between "Pointer and Array "and "Pointer and function "
- (c) What is nesting of member classes?
- (d) Write exception in detail with same example.
- (e) Illustrate purpose of protected specifiers in C++

**Q.6** **Attempt Any Two** (16)

- (a) Illustrate how to overload unary and binary operator using C++ programme.
- (b) Write a programme to declare a class "student " consisting of data member stud-name, Roll No and Gender. Write programme with member function accept () to accept and display () to display the data for four students. Using pointer.
- (c) Write a program for runtime polymorphism using virtual function with suitable example.

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TIME ALLOWED: 03 HOURS  
MAXIMUM MARKS: 100  
COURSE: DATA STRUCTURE

SEAT NO. \_\_\_\_\_  
SEMESTER: III  
PROGRAMME: COMPUTER ENGG.  
CODE : 168915

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) Attempt all questions each from Section I & Section II.
- (3) Illustrate your answer with neat sketches, wherever necessary.
- (4) Use of Mathematical and Steam tables and pocket calculator (non-programmable) is permissible.
- (5) Figures to the right indicate full marks.
- (6) Assume suitable additional data, if necessary.
- (7) Student should read the name and code of the subject and confirm that the question paper received is as per subject registered.

**SECTION-I**

**Q.1**

**Attempt Any Six out of Eight**

(18)

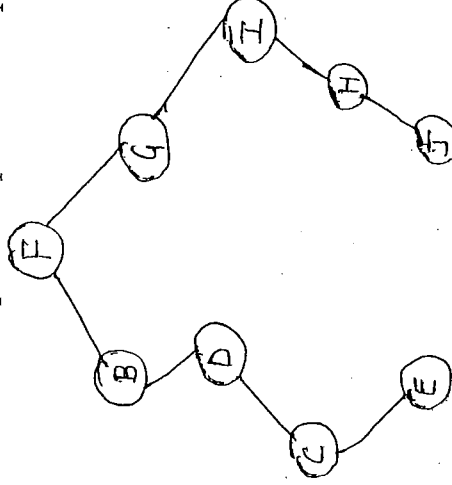
- (a) Classify the various types of data structure with example of each.
- (b) Explain recursion with a suitable example.
- (c) Describe priority queue and declare the structure for the node of a priority queue.
- (d) Write the advantages of a linked list over an array.
- (e) Discuss the creation of a singly linked list with the help of diagram.
- (f) Define (i) Complete binary tree (ii) Binary search tree
- (g) Describe doubly linked list and write the structure of its node.
- (h) Compare LL and RR rotation in AVL tree.

**Q.2**

**Answer Any Four out of Six**

(16)

- (a) Convert the following infix expression in its equivalent prefix and postfix form.  $A + (B * C - \left(\frac{D}{E}\right) * G) * H$
- (b) Give an algorithm to insert and delete an element in an array.
- (c) List the operations on a stack and write a C snippet for each.
- (d) Write an algorithm to insert an element after a given node in Doubly Linked List.
- (e) For the below given binary tree, write the preorder and postorder traversal sequence. Also write the sequence of preorder and postorder traversal.



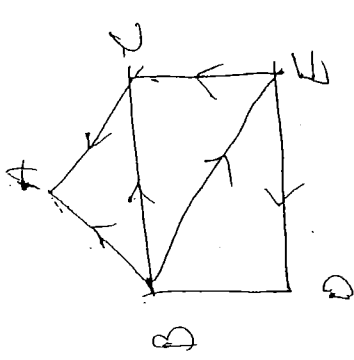
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168915

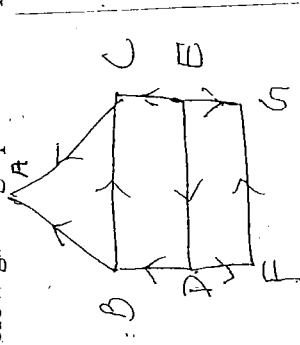
- (f) Write an algorithm to search a particular element in a singly unsorted linked list. (16)
- Q.3**
- Answer Any Two out of Three**
- (a) Evaluate the below given postfix expression with the help of a stack  $AB + CD - /$  where  $A=2, B=3, C=1, D=5$
- (b) Draw the tree T, supposing the following 8 numbers are inserted in order into an empty Binary Search Tree. Show each step 50, 33, 44, 22, 77, 35, 60, 40, write on algorithm to insert on element into binary search tree.
- (c) Write a C program to create a queue using linked organisation and perform insert, delete and display operation on it.

**SECTION-II**

- Q.4** (18)
- Answer Any Six out of Eight**
- (a) Explain adjacency matrix and path matrix with the help of a graph.
- (b) Define hashing Use the hash function  $f[(x * 10)/2]$  to insert 125 at its location.
- (c) Write various asymptotic notation and explain how to determine the efficiency of an algorithm.
- (d) Sort following numbers using insertion sort 10, 2, 35, 60, 75, 5, 99, 70
- (e) Define : (i) Weighted graph (ii) Directed graph (iii) Multi graph
- (f) Give various applications of file structure.
- (g) Describe Indexed Sequential file.
- (h) Write the adjacency list for the following given graph.



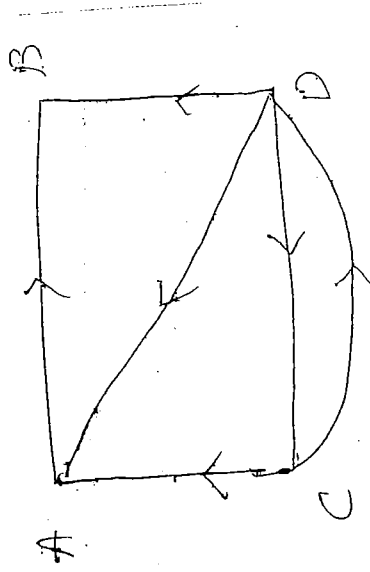
- Q.5** (16)
- Answer Any Four out of Six**
- (a) Sort the following numbers using Radix sort. Show each pass. 25, 11, 101, 28, 150, 8, 7
- (b) Write an algorithm for selection sort and explain with a small example.
- (c) Compare Hierarchical Network and relational database.
- (d) For the below given graph find the path matrix.



- (e) Explain the DFS algorithm to traverse all nodes of a graph.



- (f) For the below given graph find the shortest path matrix with the help of Dijkstra's algorithm.



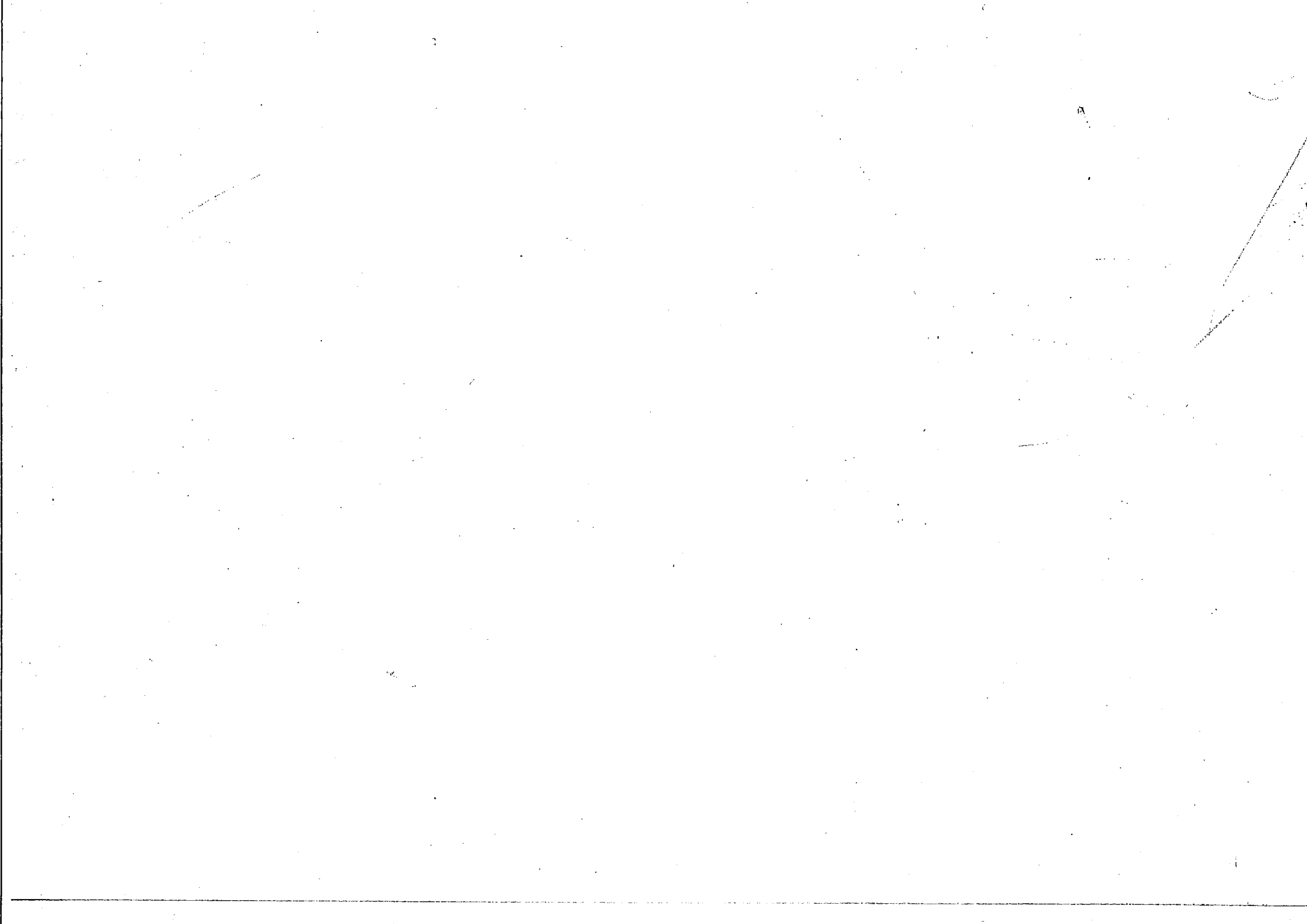
(16)

Q.6

Answer Two out of Three

- Write a C program to sort 'n' numbers using merge sort.
- Write an algorithm for Breadth first search and explain it with example.
- Explain the typical software organisation in file management system.

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**SHRI BHAGUBHAI MAFATLAL POLYTECHNIC**  
**AUTONOMOUS SEMESTER EXAMINATION APRIL/MAY-2018**

SEAT NO. \_\_\_\_\_

TIME ALLOWED: 03 HOURS

SEMESTER: III/IV

MAXIMUM MARKS: 100

PROGRAMME: I.T/ COMP

COURSE: DATABASE MANAGEMENT SYSTEM

CODE: 168918

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) Attempt **ALL** Questions from Section I & Section II.
- (3) Illustrate your answer with neat sketches, wherever necessary.
- (4) Use of Mathematical and Steam tables and pocket calculator (non-programmable) is permissible.
- (5) Figures to the right indicate full marks.
- (6) Assume suitable additional data, if necessary.
- (7) Student should read the name and code of the subject and confirm that the question paper received is as per subject registered.

**SECTION-I**

**Q.1**

**Solve Any Six of following**

**(18)**

- (a) Discuss the merits and demerits of Hierarchical data model.
- (b) Discuss disadvantages of file system as data storage medium.
- (c) Describe Foreign key constraint.
- (d) Define term. Give Needs of Data Abstraction and explain briefly.
- (e) With the help of examples, explain terms Data Definition, Data Manipulation and Data Control Languages.
- (f) Write the aggregate functions in SQL with proper examples.
- (g) Explain briefly fixed length and variable length records with respective file organisation.
- (h) Give characteristics of E-R model.

**Q.2**

**Solve Any Four of following**

**(16)**

- (a) Explain natural and Cartesian Join with syntax and suitable example query.
- (b) With suitable example describe 'having' and 'distinct' clause. How is 'having' different from 'where' clause?
- (c) With the help of diagram explain generalization with respect to database. How is it related to aggregation?
- (d) Write with suitable example, the constraints applicable on DB tables.
- (e) Consider a following table-Employee(Emp-id, First\_name, Last\_name) write the SQL query for-
  - (i) Get First\_name from Employee table in upper case
  - (ii) Select first 3 characters of Last\_name from Employee table
  - (iii) Get length of First\_name from Employee Table
- (f) Consider a suitable students' Table structure: Write SQL queries for –
  - (i) Find all students whose names start with 'M'
  - (ii) Find all students born after year 1985
  - (iii) Write SQL statements to remove the data from table and to remove the schema.

**Q.3****Write Any Two****(16)**

- (a) Explain different operation to retrieving Data, Sorting Data and grouping data with help of suitable examples.
- (b) Explain in detail the physical storage media.
- (c) Give the roles of DBA? Write in detail various Database Users and roles.

**SECTION-II****Q.4****Solve Any Six out of Eight.****(18)**

- (a) Compare shadow based recovery scheme with log based recovery scheme.
- (b) Explain the purpose of check point mechanism.
- (c) Explain the rules that can be inferred using Armstrong Axioms.
- (d) What are ACID properties of a transaction? Explain each property in brief.
- (e) Since every conflict serializable schedule is view serializable why do we emphasize conflict serializability rather than view serializability?
- (f) Explain the difference between three storage types of volatile non-volatile and stable in terms of I/o cost.
- (g) Describe term Cascade less schedule why is cascade less a desirable property.
- (h) During its execution a transaction passes through various phases. Until it commits or aborts .List all possible sequence of states through which a transaction may pass. Explain why each state may occur?

**Q.5****Solve Any Four out of Six.****(16)**

- (a) Describe the process of query processing and optimization.
- (b) With suitable example explain the concept of deadlock. What techniques can be used to avoid deadlock?
- (c) Describe the working of time stamp ordering protocol in detail.
- (d) Give the difference between implicit and explicit locking with respect to granularity locking
- (e) Enlist the desirable properties of decomposition. What do you mean by dependency preservation?
- (f) Explain the phantom phenomenon. Why can this phenomenon lead to an incorrect concurrent execution despite the use of two phase locking protocol?

**Q.6****Solve Any Two out of Three****(16)**

- (a) Define the term normalization. Enlist and describe the various normal forms and how to achieve those normal forms with the help of suitable example.
- (b) Describe two phase locking rigorous two phase locking and two phase locking. Compare and state the drawbacks and benefits of each method of backing.
- (c) Give an example of serializable schedule. What is a recoverable schedule? Are there any circumstances in which it would be useful to allow non-recoverable schedules?

Shri Vile Parle Kelavani Mandal's  
SHRI BHAGUBHAI MAFATLAL POLYTECHNIC  
AUTONOMOUS SEMESTER EXAMINATION APRIL/MAY- 2018

TIME ALLOWED: 03 HOURS  
MAXIMUM MARKS: 100

SEAT NO. \_\_\_\_\_  
SEMESTER: III  
PROGRAMME: Computer Engg.

COURSE: Fundamentals of Computer Network CODE: 160804

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) Attempt **all** questions.
- (3) All Questions are compulsory.
- (4) Use of Mathematical and Steam tables and pocket calculator (non-programmable) is permissible.
- (5) Illustrate your answers with neat sketches, wherever necessary.
- (6) Figures to the right indicate full marks.
- (7) Assume suitable additional data, if necessary.
- (8) The student should read the name and code of the subject and confirm that the question paper received is as per subject registered.

**SECTION - I**

- Q.1 Solve any **SIX out of EIGHT** (18)
- a) Write function of Network Layer.
  - b) Explain mesh topology with advantages and disadvantages.
  - c) Describe communication system with neat diagram.
  - d) Compare wireless & wired transmission.
  - e) Describe different types of addressing used in computer network.
  - f) Explain header and trailer and its role in communication process.
  - g) Describe ASK with neat diagram.
  - h) Explain Alternation, Noise & Distortion.
- Q.2 Attempt any **FOUR out of SIX** (16)
- (a) Describe WAN, MAN and LAN with diagram.
  - (b) Explain pulse code modulation with neat diagram.
  - (c) Compare parallel and serial transmission.
  - (d) Explain concept of sliding window.
  - (e) Describe WDM with diagram.
  - (f) Explain how data rate is managed in Time Division Multiplexing.

- Q.3 Attempt any **TWO out of THREE** (16)
- (1) Describe Go – Back – N protocol with neat diagram.
  - (2) Explain frequency division multiplexing in detail.
  - (3) Describe datagram network with neat diagram.

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**SECTION-II**

Q.4 **Attempt any SIX of the following.** (18)

- a) Explain QoS in network with different parameters.
- b) Explain Network Layer design Issues. (Any Four design issues)
- c) What is channel allocation problem and its need?
- d) What is Ethernet? Explain with types.
- e) Compare TCP and UDP.
- f) Define w.r.t. transport layer i) Port ii) IP address
- g) Describe FTP in brief.
- h) Write the use of cookies.

Q.5 **Attempt any FOUR out of SIX** (16)

- a) Explain tunnelling and Internetworking.
- b) What is socket? Explain with its types.
- c) Explain Broadband wireless.
- d) Write short note on a) www b) DNS
- e) Write Three – way hand shake protocol in TCP
- f) Describe SMTP in detail with a suitable diagram.

Q.6 **Attempt any TWO out of THREE** (16)

- a) Explain different Routing Algorithms.
- b) Explain Multiple Access Protocols.
- c) Explain congestion control principles.

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Shri Vile Parle Kelavani Mandal's  
SHRI BHAGUBHAI MAFATLAL POLYTECHNIC  
AUTONOMOUS SEMESTER EXAMINATION APRIL / MAY 2018

TIME ALLOWED: 03 HOURS  
MAXIMUM MARKS: 100  
COURSE: MICROPROCESSOR AND  
MICROCONTROLLERS

SEAT NO. \_\_\_\_\_  
SEMESTER: IV  
PROGRAMME: COMPUTER ENGG.  
CODE: 160805

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) All questions are compulsory.
- (3) Illustrate your answer with neat sketches, wherever necessary.
- (4) Use of Mathematical and steam tables and pocket calculator (non-programmable) is Permissible.
- (5) Figures to the right indicate full marks.
- (6) Assume suitable additional data, if necessary.
- (7) Student should read the name and code of the subject and confirm that the question paper received is as per subject registered.

**SECTION-I**

**Q.1 Attempt any Six** (18)

- (a) Enlist minimum 4 features of 80486
- (b) Explain use of following pins of 8086
  - i)  $DT/\bar{R}$
  - ii)  $\overline{LOCK}$
- (c) Draw minimum mode of 8086
- (d) W.A.P. to find 2's complement of given number using 8051 $\mu$ .
- (e) Draw flag register of 8086 and explain any two flags.
- (f) Define the role of coprocessor 8087
- (g) Differentiate between ADD & ADC instruction in 8086,
- (h) Explain DAA instruction with the help of example of 8086.

**Q.2 Attempt any Six** (16)

- (a) Explain Internal & External Memories of 8051.
- (b) Explain following stack instructions of 8051 $\mu$ C
  - a) PUSH
  - b) POP
- (c) Draw block diagram of 80386 and explain code prefetch unit.
- (d) Explain IO programming with following
  - i) IN
  - ii) OUT
- (e) Draw timing diagram for minimum mode of 8086 for read cycle.
- (f) Explain oscillator & Clock circuit of 8051  $\mu$ C with suitable diagram.

PTO

**Q.3****Attempt any Two****(16)**

- (a) Draw and explain architecture of 8086  
(b) Explain following addressing mode with example with respect to 8086:  
1) Register addressing mode  
2) Direct addressing mode  
3) Immediate addressing mode  
4) Based indexed mode  
(c) Explain the following string instructions  
1) LODS 2) STOS 3) CMPS 4) SCAS

**SECTION-II****Q.4****Attempt any Six****(18)**

- (a) Explain the serial port functionally of 8051 $\mu$ C  
(b) Define baud rate. Explain with example.  
(c) Differentiate between the uses of 8051 as timer & counter.  
(d) Explain software generated interrupts of 8051.  
(e) Compare RET & RETI instructions.  
(f) Draw interfacing of 7 segment display device with 8051 microcontroller.  
(g) Write the Interrupts of 8051 as per priority order lower to higher. Also give their significance.  
(h) Draw 4x4 keyboard interfacing with 8051 microcontroller

**Q.5****Attempt any Four****(16)**

- (a) Write an ALP for 8051 microcontroller to transfer letter 'A' serially at 4800 baud rate continuously.  
(b) Give the working of the SFRS:-  
i) IE ii) IP iii) TEON iv) SBUF  
(c) Describe the stepper motor control using 8051 $\mu$ C  
(d) Explain the following with respect to 8051  
i) Interrupt service Runtime  
ii) Interrupt vector table  
(e) Write Embedded 'C' program to make 8 LED's (connected to port '2' of 8051) ON & Off after 100MS delay.  
(f) Explain Interrupt Vs polling with suitable example.

**Q.6****Attempt any two****(16)**

- (a) State the various modes of timer operations of 8051. Write embedded 'C' program to generate a square wave on P1.5 bit. VSE timer 'O' to generate the time delay.  
(b) Write an ALP to receive serial data bytes and put them on port '1'. Assume baud rate of 9600, 8 bit data 1 stop bit.  
(c) Draw interfacing of LCD display with 8051 $\mu$ C and explain the working of pins.

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Shri Vile Parle Kelavani Mandal's  
**SHRI BHAGUBHAI MAFATLAL POLYTECHNIC**  
**AUTONOMOUS SEMESTER EXAMINATION APRIL/MAY- 2018**

TIME ALLOWED: 03 HOURS

MAXIMUM MARKS: 100

COURSE: FUNDAMENTAL OF OPERATING SYSTEMS

SEAT NO. \_\_\_\_\_

SEMESTER: IV

PROGRAMME: CSE/IT

CODE: 168916

**INSTRUCTIONS:**

- (1) Answer to the two sections must be written in separate answer books.
- (2) Attempt all questions each from Section I & Section II.
- (3) Illustrate your answer with neat sketches, wherever necessary.
- (4) Use of Mathematical and Steam tables and pocket calculator (non-programmable) is permissible.
- (5) Figures to the right indicate full marks.
- (6) Assume suitable additional data, if necessary.
- (7) Student should read the name and code of the subject and confirm that the question paper received is as per subject registered.

**SECTION-I**

**Q.1 Attempt Any Six out of Eight**

**(18)**

- (a) List the services of operating systems for process management.
- (b) Discuss the role of disk controller and drivers in file management.
- (c) Explain the concept of binary semaphore.
- (d) Give the difference between Process and Thread.
- (e) Discuss single process monitor results in low CPU utilisation and memory capacity.
- (f) List the classical programmes used in concurrent programming.
- (g) What is convoy effect?
- (h) Explain the conditional critical region (CCR) considered as good instruments for describing and designing process synchronisation in real time systems.

**Q.2 Attempt Any Four out of Six**

**(16)**

- (a) Explain any one method of Fire Allocation.
- (b) Discuss address translation in paging.
- (c) Explain process control block and enlist its contents.
- (d) Discuss the first algo. For mutual exclusion and discuss its advantages.
- (e) Discuss the fixed partitioning methods for memory assignment.
- (f) Compare and contrast page replacement algorithm: - FIFO and LRU.

**Q.3 Attempt Any Two out of Three**

**(16)**

- (a) Differentiate between paging and segmentation. Explain least recently used page replacement policy (LRU)
- (b) What is mutual exclusion? Explain producer / consumer problem with semaphore.
- (c) Write briefly notes on :
  - (i) Hardware support for mutual exclusion
  - (ii) Multi level 'Q' scheduling

## SECTION-II

### Q.4 Solve Any Six out of Eight. (18)

- (a) Enlist various biometric authentication techniques. Explain how they prove uniqueness of the authenticated party.
- (b) What are the stages of virus? Exploit.
- (c) Explain 'FLYNN'S' classification of multiprocessor system.
- (d) Write the steps of RSA algorithm.
- (e) Enumerate the different types of multiprocessor operating system.
- (f) Explain the following term with respect to access control matrix
  - (i) tickets
  - (ii) Capabilities
- (g) Write in brief about the "Wound and wait" and 'wait and die 'scheme in distributed concurrency control.
- (h) What is a bit map what role does it play in space indexed allocation of sick.

### Q.5 Solve Any Four out of Six (16)

- (a) What are different methods of non-caliginous allocation of disk space? Explain in detail chained and indexed allocation.
- (b) With the help of neat diagram explain the cross bar connection in multiprocessor systems. Compare the same with hypercube connection.
- (c) Explain 'wave scheduling' in detail where and how is it used?
- (d) Justify the security of digital signature algorithm.
- (e) Differentiate between mandatory access control and discretionary access control. Describe access control matrix.
- (f) What are distributed operating system? What is the importance of lamports algorithm in distributed systems? Explain the working of Lamport algorithm.

### Q.6 Solve Any Two out of Three (16)

- (a) With the help of a neat diagram explain the working of 'CHAN6 & ROBERT algorithm for the election of successor made in distributed systems.
- (b) Using a neat diagrams describe and compare the working of hypercube connection, multistage connection.
- (c) What are the different types of penetration attempts made to breach security in computer systems with the help of a neat diagram explain with working of Lattice model of Information flow.