

VALLABH BUDHI POLYTECHNIC , NAVSARI

MID TEST [APRIL-2009]

[Time : 1:30 Hours]

[Total Marks : 40]

[Sub Name : EDC - I]

Enrl. No. :

Sup. Sign

With Date :.....

Instruction : (1) Use of Programmable calculator or any such Mathematical aid is strictly prohibited.

(2) Mobile phone strictly prohibited in Examination premises.

(3) Draw neat sketches wherever necessary.

(4) Attempt all questions.

(5) Figures to the Right indicate full marks.

(6) Assume suitable additional data if necessary

Q-1 Explain the difference between Conductors, Semi-conductors and Insulators by showing their energy levels. (06)

Q-2 Draw the Bridge Rectifier circuit, explain its operation and mention its advantages & disadvantages. (06)

OR

Q-2 Explain Voltage Doubler & Multiplier with circuit diagram. (06)

Q-3 Describe Clamping & Clipping action of a Diode in details with necessary circuits. Draw its input & output waveforms. Mention its applications. (08)

Q-4 Explain working of NPN or PNP transistor. (06)

Q-5 Define α & β of transistor and obtain relation between them. (06)

OR

Q-5 Short Note: Thermal Runaway & Heat Sink. (06)

Q-6 State reasons for Thermal instability & Explain Voltage Divider type biasing method in detail. (08)

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Q-1 (A) Define and explain resistivity and also state and explain factor effecting value of resistance. (5)

(B) Three resistance 20 ohm, 40 ohm and 50 ohm are connected in parallel across 220 v supply calculate (1) Equivalent resistance (2) Total current (3) voltage drop in each resistance (4) power loss. (5)

Q-2 (A) State and explain in detail kirchoff's current law and voltage law. (5)

OR

(A) Explain super position theorem with illustration.

(B) Derive formula for resistance temperature co-efficient (α_0) (5)

Q-3 (A) A coil of 500 turns and resistance 20 ohm wound uniformly on an iron ring of mean circumference 50 cm and cross sectional area 4 cm² It is connected to D.C. 24 volt supply. Relative permeability of iron is 800 calculate (5)

(1) M.M.F of coil (2) Reluctance of the ring

(3) Total flux (4) Flux density

(5) Magnetizing force

(B) Define (any five) (5)

(1) EMF (2) Power (3) Flux density (4) Permittivity (5) Reluctivity

(6) Magnetic field intensity (7) Relative permeability

Q-4 (A) Define following terms: (5)

(1) R.M.S value (2) Phase difference (3) Average value (4) Form factor

(5) Peak factor

(B) Derive Ir.m.s. = $I_{max} / \sqrt{2}$ for sin wave (5)

OR

(C) Given equation for A.C. is $I = 42.42 \sin 628t$ find

(1) Maximum value of current (2) Frequency

(3) R.M.S. value (4) Average value

(5) Form factor.

VALLABH BUDHI POLYTECHNIC , NAVSARI

MID TEST [APRIL-2009]

[Time : 2 Hours]

[Total Marks : 40]

[Sub Name : M.D.]

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Q-1 (A) Two views of an object is shown in **fig.1**. Draw following views using “first angle projection method”. Give dimensions by “unidirectional method”.

(a) Sectional Front View (b) Right Hand Side View.... (08)

(B) State the Types of Sections & Draw Any Two. (Free Hand)..... (05)

Q-2. A Pentagonal prism is resting on one of the corners of its base on the H.P. The longer edge containing that corner is inclined at 45° to the H.P. The axis of the prism makes an angle of 30° to the V.P. Draw the Projections of the Solid. Take the side of the base 35mm & Height 75mm.
..... (07)

OR

Q-2. Draw the projection of a cone, base diameter of 50mm and axis 65mm long. When it is resting on the ground, one of its generators is perpendicular to the H.P. and its axis is inclined at 45° to the V.P. (07)

Q-3 Assembly drawing of all parts of “knuckle joint” is given on **fig.2** Prepare detailed drawing showing the TWO views of each part with dimensions. Show method of projection used.
..... (10)

Q-4 (A) Explain The Following Terms by using Neat Sketch.

(1) Basic Shaft & Basic Hole (2) upper & lower deviation (3) Clearance fit

(4) $\phi 50H_7g_6$ (5) Difference between Hole basis system & shaft basis system (05)

[P.T.O.]

(B) In drawing, a fit is designated as $\text{Ø } 50\text{H}_7\text{d}_8$. Draw the fit and find the Following (05)

- 1) Max. & Min. limits of Hole.
- 2) Max. & Min. limits of Shaft.
- 3) Tolerance for Hole & Shaft.
- 4) Upper & Lower deviation for shaft & Hole.
- 5) State the types of fit.

For 50 mm dia. Deviation in microns are as follow.

	Upper	Lower
H_7	+30	00
d_8	-100	-147

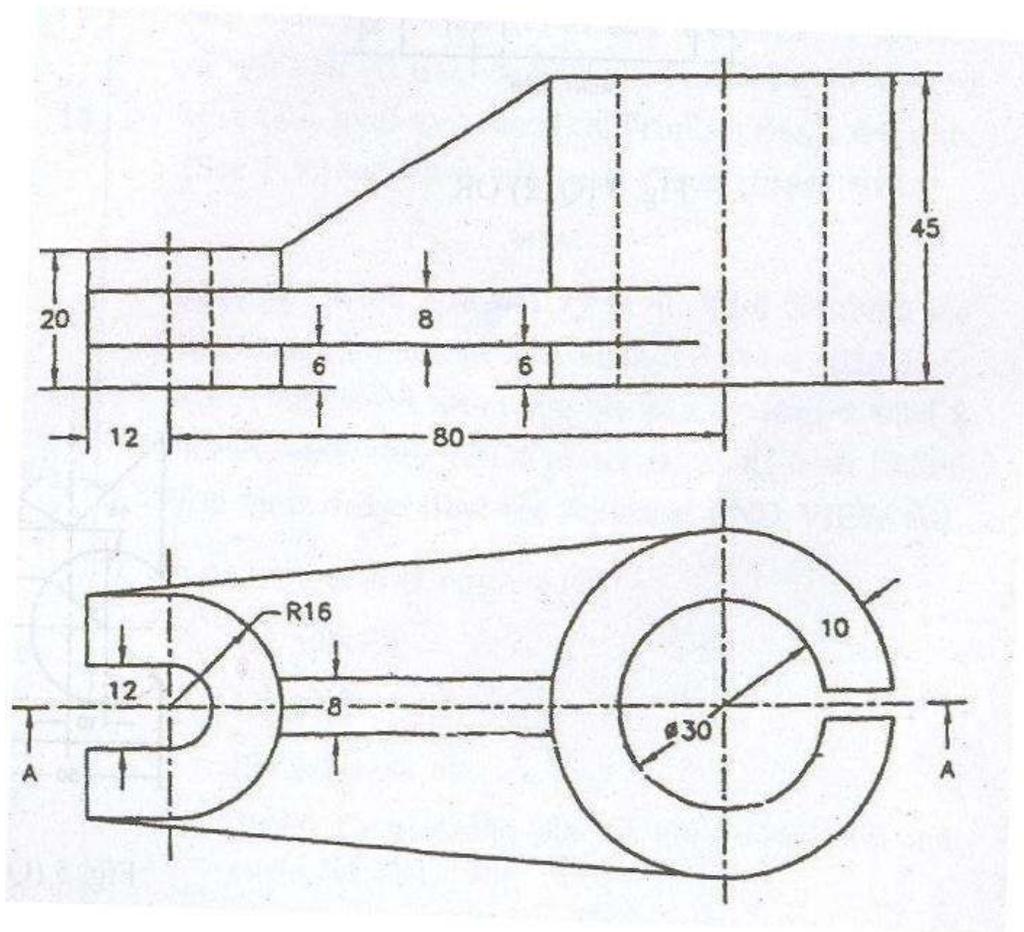


Fig.1

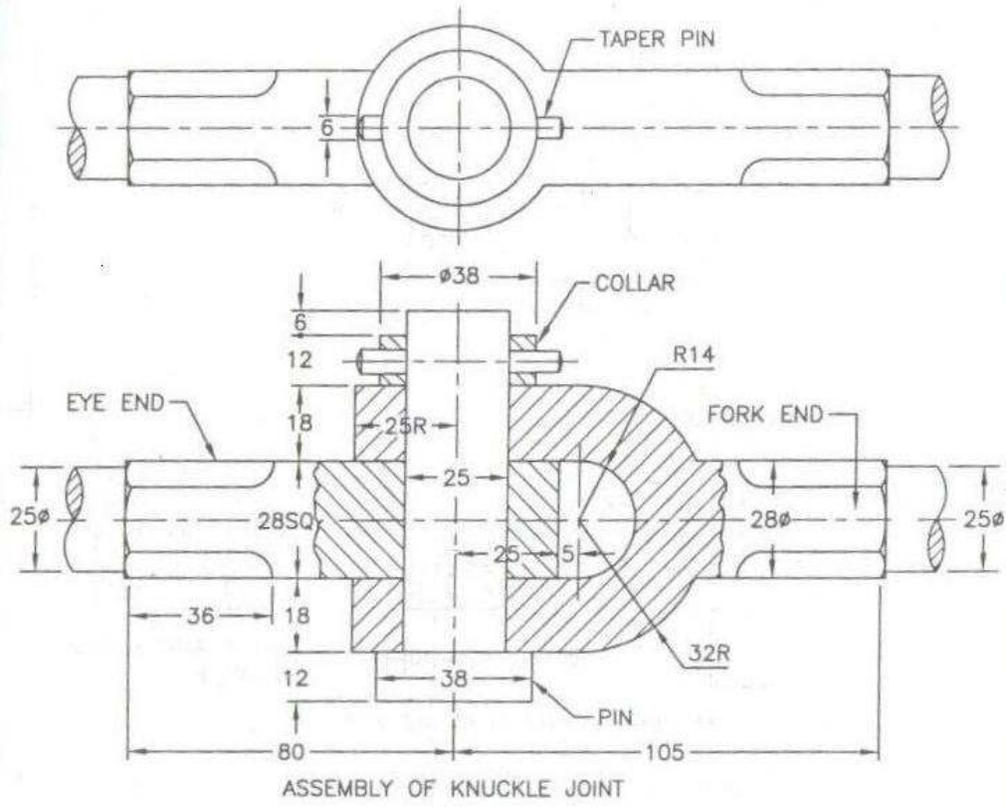


Fig.2

VALLABH BUDHI POLYTECHNIC , NAVSARI

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Q.1 (A) Compare flat belt with V-belt (5)

(B) Find out power transmitted by belt from following data:

(i) Angle of contact=160 degree (ii) co-efficient of friction=0.24

(iii) Mass of belt = 5 kg/m. (iv) Maximum Tension of belt = 2500N

(v) Belt velocity = 15 m/s (5)

OR

(B) Define Gear Train. Explain any two type of gear train with neat sketch (5)

Q.2 (A) State advantages of steam turbine over steam engine (5)

(B) Evaluate ratio of driving tensions in belt (5)

OR

(B) Explain difference between impulse and reaction turbine (5)

Q.3 (A) Compare Centrifugal pump with Reciprocating pump (5)

(B) Explain briefly the working of Reciprocating pump with a neat sketch (5)

OR

(B) State the faults in pump. Explain Causes and Remedies in the following case:

(i) Pump fails to start (ii) Excessive vibration of pump (5)

Q.4 (A) Write short note on any two:

(i) Priming (ii) Air-vessel (iii) Strainer and Foot valve (5)

(B) Derive the condition for maximum power transmission (5)

OR

Q.4 (A) Explain Lay-out of Centrifugal pump with neat sketch (5)

(B) What is Compounding? Explain any one type with simple diagram (5)

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Q-1 –(A) Explain the term surveying. List the instrument used for Chain & Tape survey. Show with the neat sketch first link of the chain with its parts. (5 marks)

Q-1—(B) Explain about Reconnaissance survey and purpose of reconnaissance survey. (5 marks)

OR

Q-1—(B) Explain about the direct ranging and write a short note on field book

Q-2—(A) State factors to be considered while selecting site for industrial shed. (5 marks)

Q-2—(B) Draw the neat and clean sketch of dumpy level & label its parts. (4 marks)

OR

Q-2—(B) Draw the neat and clean sketch of prismatic compass & label its parts.

Q-3—(A) Following readings were taken on continuous ground. Determine R.L of all the Points by height of instrument (H.I) method and show arithmetical check also.

1.465,0.875,0.075,3.560,2.40,2.005,0.065,3.800,2.905 (TAKE BM=15Metre) (5 marks)

Q-3--(B) Convert the following Fore bearings into Back bearing. (4 marks)

(1) $300^{\circ} 45'$ (2) $125^{\circ} 30'$ (3) $60^{\circ} 15'$ (4) $218^{\circ} 15'$

Q-4 –(A) * Draw symbols / conventional sign for the following---(ANY FIVE) (3 marks)

(1) Brick masonry work (2) Earth work (3) Two way slab (4) Tor steel

(5) North line (6) Compound wall with gate (7) Chain line (8) Main station

* Write full forms for the following abbreviations. (ANY FIVE) (3 marks)

(1) R.C.C. (2) P.C.C. (3) D.P.C. (4) B.B.L.C

(5) B.B.C.C. (6) V.P. (7) M.H. (8) G.L

Q-4—(B) Explain the following terms --- (ANY FOUR) (6 marks)

(1) Levelling (2) W.C.B (3) Quadrantal bearing. (4) B.M

(5) H.I (6) C.P (7) Datum (8) Offset

OR

Q -4—(B) Differentiate between- (6 marks)

(1) H.I Method and Rise-Fall method

(2) First angle method of projection & Third angle Method of projection.

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(4) Attempt all questions.

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Q-1 Give the definition of following. [Any eight] (8)

- (1) Conventional sources (2) Energy crisis (3) Refraction (4) Wind mill
(5) Photosynthesis (6) Biomass (7) Light reaction (8) Dark reaction
(9) Reflection (10) wind energy

Q-2 Answer the following questions. [Any two] (8)

- (1) Comparison between conventional and non-conventional sources of energy
(2) Limitation of renewable sources of energy.
(3) Application and limitation of solar energy.

Q-3 Answer the following questions

- (1) Types of solar radiation (3)
(2) List instruments of solar radiation measurements. Explain any one in brief with neat sketch. (5)

Q-4 Answer the following questions

- (1) Relation between wind velocity, air mass and wind power. (3)
(2) Definition of important terms used in wind power generation. (5)

OR

- (2) Explain.: Gustiness and units of Gust (5)

Q-5 Answer the following questions. [Any two] (8)

- (1) Write down advantages of biomass.
(2) Discuss factors affecting photosynthesis process .
(3) Write down characteristics of biomass

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(4) Attempt all questions.

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Q.1 (A) Write any Two. (4)

- (1) Library file
- (2) Keyword and Identifier
- (3) Different between Constant and Variabl

(B) Write any Two. (6)

- (1) Explain If else with Example..
- (2) Explain Relational Operator with example.
- (3) Write Algorithm of find area of Circle.

Q.2 (A) Write any Two. (5)

- (1) Write Program to find Factorial of given number.
- (2) Explain For with Example.
- (3) Write different between Do and Do while.

(B) Write any One. (5)

- (1) What is Conditional Operator? Explain with example.
- (2) Explain Switch with example.

Q.3 (A) Calculate any Two. (4)

- (1) $5 - 4 * 5 + 2 * 3$.
- (2) $6 + 12 / 2 - (4 + 5) \$ 2$
- (3) $4 * 3 * 3 * (2 + 3 + 6) / 3$

(B) Write any two. (6)

- (1) Find the Minimum number from given three number.
- (2) Dram flowchart of number is Odd or Even.

(3) Print below pattern. (Using for loop)

```
1
1 2
1 2 3
```

Q.4 (A) Write Output of given Program. (3 – 2)

(4)

(1)

```
void main()
{
    int i, j, k, l;
    i = 5; j = 7;
    k = i++ + ++i + ++i;
    l = j++ + ++i + ++j;
    printf("\n %d \n %d \n %d \n %d", ++i, j, k++, l);
    getch();
}
```

(2)

```
void main()
{
    int i, j, k, l;
    clrscr();
    i = 9; j = 0;
    k = i++ + ++i + ++i;
    l = j-- + ++i + --j;
    printf("\n %d \n %d \n %d \n %d", ++i, j, k++, l);
    getch();
}
```

(3)

```
void main()
{
    int i, j, k, l;
    i = 9; j = 4;
    i++; --j;
    k = i++ + 3;
    l = j-- + ++k;
    printf("\n %d \n %d \n %d \n %d", i, j, k, l);
    getch();
}
```

(B) Write any One.

(6)

(1) Find root of below equation.

$$Ax^2 + Bx + C = 0$$

(2) Print Fibonacci series on screen.

0 1 1 2 3 5 8 13

VALLABH BUDHI POLYTECHNIC , NAVSARI

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[Sub Name : A.S-II(Chemistry)]

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Q-1 (A) Answer Any Four of the following . (10)

(1) Give the full meaning of the following.

(a) ${}_{13}\text{Al}^{26}$ (b) ${}_{14}\text{Si}^{28}$

(2) State and explain Aufbau Principle.

(3) Define: (a) Ionization (b) Electron Affinity.

(4) Calculate the PH of (a) 0.001 M HCl (b) 0.01 M Fe (OH)₃

(5) Explain: What is N-Type Semiconductor?

(6) Explain metal Cladding.

Q-2 Answer any Four of the following (10)

(1) Derive Ionisation constant of water.

(2) Explain Co-Valent bond with suitable example.

(3) Write the electronic Configuration of

(a) ${}_{11}\text{Na}^{23}$ (b) ${}_{17}\text{Cl}^{35}$

(4) Explain Pitting Corrosion.

(5) Define pH and its importance.

(6) Define buffer solution and give an example.

Q-3 Answer any Four of the Following. (10)

(1) Explain the construction and working of Electro Chemical Cell.

(2) Explain the bond formation in NaCl.

(3) Explain the extraction of Magnesium.

(4) Explain the Ionisation Of Weak acid.

(5) Calculate the pH of (a) 0.2 M H₂SO₄ (b) 0.0016 N NaOH

(6) Explain Strong electrolyte with Suitable example

Q-4 Answer any Four of the Following (10)

(1) Explain Hydrogen bond with an example.

(2) What is Ionization ? State the factors affecting the degree of Ionization .

(3) Explain Electroplating.

(4) Define any two (a) Nucleons (b) orbital (c) Atomic Number.

(5) Explain the standard hydrogen electrode giving construction and its working.

(6) Draw the shape of " S" and "P" orbital.

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Q : (1) Define following terms [10]

- 1) Cycle
- 2) Time period
- 3) Frequency
- 4) Instantaneous value
- 5) Amplitude
- 6) Form factor
- 7) Phase difference
- 8) Phase
- 9) Phase factor
- 10) Average value

Q : (2) Define and explain RMS value of alternating quantity. [5]

Q : (3) The maximum value of alternating current is 20 A. Find out RMS value.

Write current equation for the 20 ms time period.

Find out the time to reach value -5 A second time after zero. [5]

Q : (4) Addition of following vector. [5]

$$I_1 = 50 \sin (\omega t + \pi / 3)$$

$$I_2 = 40 \sin (\omega t - \pi / 6)$$

$$I_3 = 100 \sin (\omega t + 2 \pi / 3)$$

or

Q : (4) Convert following vector in polar form and exponential form. [5]

$$\bar{A} = 25 - j10$$

$$\bar{E} = -30 + j40$$

$$\hat{G} = 10 - j50$$

$$\bar{I} = 10 + j60$$

Q : (5) Derive the EMF equation of transformer. [5]

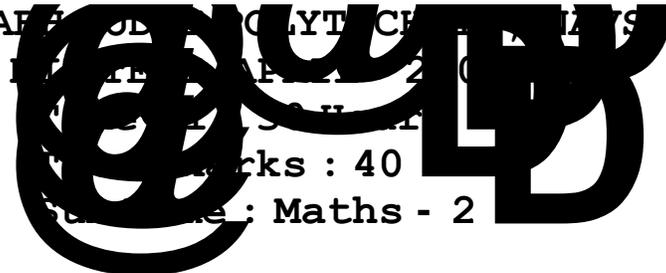
Q : (6) Explain Auto transformer. [5]

or

Q : (6) Transformer loss [5]

Q : (7) The primary of 500KVA , 4400/440 V, transformer has 500 turns . [5]

Determine secondary turns , primary current and secondary current.



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Q-1 Attempt any three :

- 1. Three points $A(2, 1)$, $B(3, 1)$ and $C(1, 1)$ are vertices of a right angled triangle.
- 2. Three points $(k, 1)$, $(3, 1)$, $(5, 1)$ are collinear, then find the value of k .
- 3. Find the coordinate of the points which divide the AB; $A(1, 0)$ and $B(3, 2)$ in the ratio 2:1.
- 4. Find the circumradius of $\triangle ABC$ where $A(3, 3)$, $B(3, -1)$ and $C(1, -1)$.

Q-2 Attempt any one :

1. Find the value of x if $\log x = \log 2 + \log 3$

2. Find the value of x if $\log x = \log 2 + \log 3 + \log 4$

3. Find the value of x if $\log x = \log 2 + \log 3 + \log 4 + \log 5$

4. Find the value of x if $\log x = \log 2 + \log 3 + \log 4 + \log 5 + \log 6$

5. Find the value of x if $\log x = \log 2 + \log 3 + \log 4 + \log 5 + \log 6 + \log 7$

6. Find the value of x if $\log x = \log 2 + \log 3 + \log 4 + \log 5 + \log 6 + \log 7 + \log 8$

7. Find the value of x if $\log x = \log 2 + \log 3 + \log 4 + \log 5 + \log 6 + \log 7 + \log 8 + \log 9$

8. Find the value of x if $\log x = \log 2 + \log 3 + \log 4 + \log 5 + \log 6 + \log 7 + \log 8 + \log 9 + \log 10$

9. Find the value of x if $\log x = \log 2 + \log 3 + \log 4 + \log 5 + \log 6 + \log 7 + \log 8 + \log 9 + \log 10 + \log 11$

10. Find the value of x if $\log x = \log 2 + \log 3 + \log 4 + \log 5 + \log 6 + \log 7 + \log 8 + \log 9 + \log 10 + \log 11 + \log 12$

Q- 3. Opt any three :

1. Prove the differentiation of e^x by using first principal differentiation

2. If $y = e^x \sin x \cos x$ then find $\frac{dy}{dx}$

3. If $y = a \cos^2 q$ then find $\frac{dy}{dx}$

4. If $y = \log \frac{a}{a-x}$ then find $\frac{dy}{dx}$

Q- 2. Opt any three :

1. If $y = \sin^{-1} x + \cos^{-1} x$ then find $\frac{dy}{dx}$

2. If $y = \tan^{-1} \frac{x}{x^2+1}$ then P.T

3. If $x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} = 0$

4. The motion equation of TATA NANO is $S = at^2 + 2bt + c$ where a b & c are constant then P.T., its acceleration is constant.

5. Find maxima and minima of $y = x + \frac{1}{x}$

Q- 4. Fill in the blank.

1. If A = $\begin{pmatrix} 1 & 0 \\ 0 & 4 \end{pmatrix}$, B = $\begin{pmatrix} 4 & 0 \\ 0 & 1 \end{pmatrix}$ then AB =

2. $\lim_{x \rightarrow 1} \frac{x^2 - x + 1}{x + 1} =$

3. $\frac{d}{dx} \log_2 x =$

4. $\frac{d}{dq} \sin^{-1} q =$