FACULTY OF ENGINEERING

B.E. 2/4 (Civil) I-Semester (Main & BL) Examination, December 2016

Subject : Surveying - I

Time : 3 hours   **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1	Differentiate between Plane and Geodetic surveying.	2
2	Mention the uses of surveying in Civil Engineering field.	3
3	Differentiate between the dip and declination.	2
4	Compare between prismatic compass and surveyors compass.	3
5	What are the advantages of plane table surveying?	2
6	Define the term orientation. How it is performed in the field?	3
7	Define the terms (a) Back sight (b) Rise	2
8	Explain briefly about profile levelling.	3
9	Draw the sketches for pond and overhanging cliff.	2
10	Write any five uses of contours.	3

PART – B (50 Marks)

11 a) Explain the term "reciprocal ranging" with a neat sketch.   3
    b) At the end of a surveying work, a 20 m chain was found to be 6 cm too long. The area of the plane drawn with the measurement taken with this chain is 122 cm^2 and the scale adopted was 2m to 1 cm. What is the true area of the field, if the chain was exactly 20 m long at the commencement of the work.   7

12 a) Differentiate between the following :
     i) Isogonic lines and Agonic lines
     ii) Quadrantal bearing and whole circle bearing   4
    b) The following FB and BB were observed in traversing with a prismatic compass in a place where local attraction was suspected. Compute the correct bearing of the lines.   6

Line	FB	BB
AB	$38^0 30'$	$219^0 15'$
BC	$100^0 45'$	$278^0 30'$
CD	$25^0 45'$	$207^0 30'$
DE	$325^0 15'$	$145^0 15'$
EA	$190^0 30'$	$10^0 15'$

13 a) Explain Radiation method of plane table survey.   3
    b) With a neat sketch, explain two point problem.   7

14 a) Explain in detail about reciprocal leveling.   5

   b) The following staff readings were observed with a level. The instrument having been moved after 3rd and 6th reading 2.250m, 0.95, 2.10, 2.85, 1.55, 0.75 and 1.85. Compute levels.   5

15 a) Calculate the area between the survey line and the boundary line with the following :   5

Distance between the offsets (m)	0	5	10	15	20	30	40	50
Offset length (m)	2	3	3	2	2	3	2	3

   b) What are the different characteristics of contours?   5

16 a) What are the temporary adjustments of a dumpy level?   4

   b) A and B are two points 200m apart along one bank of a river flowing East-West. The bearings of a tower on the other bank as observed from A and B are 40^0 and 310^0, respectively. Find the width of the river.   6

17 Write short note on the following :   10

   a) Surveyors compass

   b) Intersection method

   c) Correction for curvature and refraction.

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FACULTY OF ENGINEERING

B.E. 2/4 (EE/Inst.) I-Semester (Main) Examination, Nov. / Dec. 2016

Subject : Electronics Engineering-I

Time : 3 hours **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1	Define diffusion and transition in capacitance of diode.	3
2	What is junction breakdown in diodes?	2
3	Explain about CLC filters with neat diagram.	3
4	What is ripple factor in rectifiers?	2
5	What is thermal runaway?	2
6	Compare CE, CB CC configurations of BJT?	3
7	Explain the working of CCD.	2
8	List out the features of TRIAC.	3
9	Explain the pinch off voltage of MOSFET.	2
10	Compare CS, CD, CG amplifiers.	3

PART – B (5 x 10 = 50 Marks)

11 a) Explain working of PN junction diode. What is the effect of temperature on working of diode. 5

   b) Derive diode current equation under forward and reverse bias. 5

12 What is rectifier? Explain with the neat diagram the working principle of full-wave rectifier. Derive the expression for ripple factor of full-wave centre tapped transformer. 10

13 a) Explain with suitable diagrams the working of NPN and PNP transistor. 5

   b) Explain the operation of UJT with neat circuit diagram. 5

14 Explain the small signal model of BJT and determine h-parameters of BJT in CB, CE and CC configurations of BJT. 10

15 a) Explain the transfer characteristics of JFET. 5

   b) Discuss in detail JFET formation and JFET as a switch. 5

16 a) Describe the working of a Half-wave rectifier with i) L-section   ii) Pi section. 6

   b) Derive the relationship between the beta (β) and alpha (α) of a transistor. 4

17 Write short notes on the following : 10

   a) SCR

   b) Liquid Crystal Display

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FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I - Semester (Main) Examination, November / December 2016

Subject : Electrical Technology

Time : 3 Hours   **Max. Marks: 75**

Note: Answer all questions from Part-A and answer any five questions from Part-B.

PART – A (25 Marks)

1. Give the classification of DC generator based on their field excitation. (2)
2. Define critical resistance and critical speed. (3)
3. A 3-phase delta system has the following data:
   V_L = 400 V, I_L=40 A
   Calculate phase voltage and current. (3)
4. What is meant by 3-phase balanced system? (2)
5. Give the basic principle of operation of 3-phase alternator. (3)
6. Define synchronous impedance of a 3-phase alternator. (2)
7. Explain when the regulation of transformer is negative. (2)
8. Draw the no load phasor diagram of a transformer. (3)
9. Define slip of a 3-phase induction motor. (2)
10. Give the power stages of a 3-phase induction motor. (3)

PART – B (50 Marks)

11. (a) Derive the torque equation for a DC motor. (5)
    (b) A DC shunt generator has the following data:
    Poles = 4; Slots = 50 ; Each slot having 12 conductors
    Armature resistance = 0.09Ω ; Field resistance = 100 Ω
    Flux per pole = 20 m Wb; Armature current = 20 A
    Speed = 1000 RPM, Lap connected
    Calculate voltage across the load resistance. (5)

12. (a) Explain the constructional details and principle of operation of DC generator. (5)
    (b) Explain electrical and mechanical characteristics of DC shunt and series motors. (5)

13. (a) Explain the operation of fluorescent lamp with the help of neat schematic diagram. (5)
    (b) The power input to a 400 V, 50Hz, 3-phase delta system is measured by two watt meters are 500 W and 400 W respectively. Determine total power, power factor and line current. (5)

14. (a) Derive the emf equation of a 3-phase alternator. (5)
    (b) A 3-phase, 10 KVA, 400 V 50Hz, star connected alternator supplied the rated load at 0.8 pf lagging. If the armature resistance and synchronous reactance are 0.6Ω and 5Ω respectively, determine voltage regulation. (5)

15. (a) Explain constructional details and principle operation of 1-phase transformer. (5)
    (b) Explain the 1-phase transformer on lagging load with help of neat phasor diagram. (5)

..2

16 (a) Explain the slip-torque characteristics of a 3-phase induction motor. (5)
   (b) Explain the capacitor start motor with the help of neat schematic diagram. (5)

17 (a) Explain the production of rotating magnetic field in the 3-phase induction motor. (5)
   (b) A 25 KVA, 2200 /220 V, 50 Hz, 1-phase transformer has the following test data:

   OC test : 220V, 12A,   90 W (LV side)
   SC test : 60 V, 7A,   300 W (HV side)

   Calculate the parameters of equivalent of the transformer referred to LV side. (5)

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B.E. 2/4 (M / P / A.E) I – Semester (Main) Examination, December 2016

Subject: Machine Drawing

Time: 3 Hours   **Max.Marks: 75**

Note: Answer all questions from Part – A and Part – B.

PART – A (25 Marks)

1 Draw actual view and the convention of the following machine parts: 5
   a) Spur gear
   b) Bearing

2 Draw the following view of the components shown in figure 1:   5+5
   i)   Front view
   ii) Sectional side view

Fig. 1
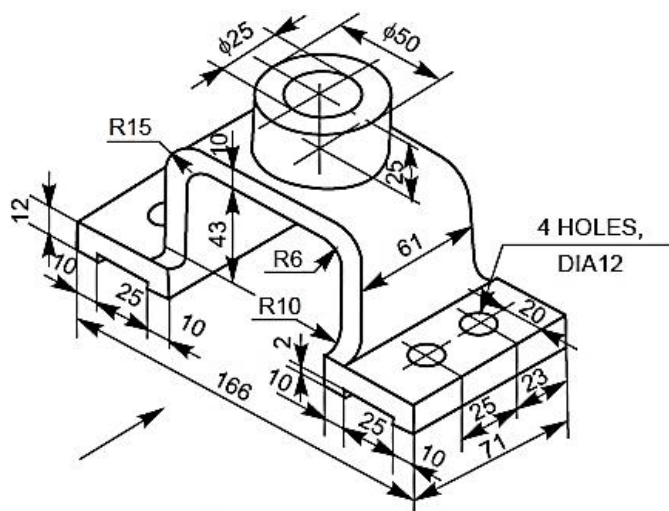
3 Sketch two view of a single riveted single strap butt joint to join plates of 10 mm thick
   and indicate pitch and margin.   5

4 Draw unified thread and ACME-thread when pitch = 10mm.   5

PART – B (50 Marks)

1. Assemble all the components shown in fig.2 to form I.C. engine connecting rod and
    draw

    i)   Sectional front view and   30

    ii) Top view   20

① Rod (1 No.—Forged Steel)

③ Bush (1 No.—G.M.)

② Brasses (2 Nos.—G.M.)

⑦ Bolt (2 Nos.—Steel)

④ Cap (1 No.—Forged Steel)

⑤ Split pin (2 Nos.—M.S.)

⑥ Castle nut (2 Nos.—Steel)

Parts List

Item	Description	Qty.	Material
1	Rod	1	F. Steel
2	Brasses	2	G.M.
3	Bush	1	G.M.
4	Cap	1	F. Steel
5	Split pin	2	M.S.
6	Castle nut	2	Steel
7	Bolt	2	Steel

Figure 2 IC engine connecting rod

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FACULTY OF ENGINEERING
B.E. 2/4 (AE) I – Semester (Main) Examination, December 2016
Subject: Automotive Engineering Drawing
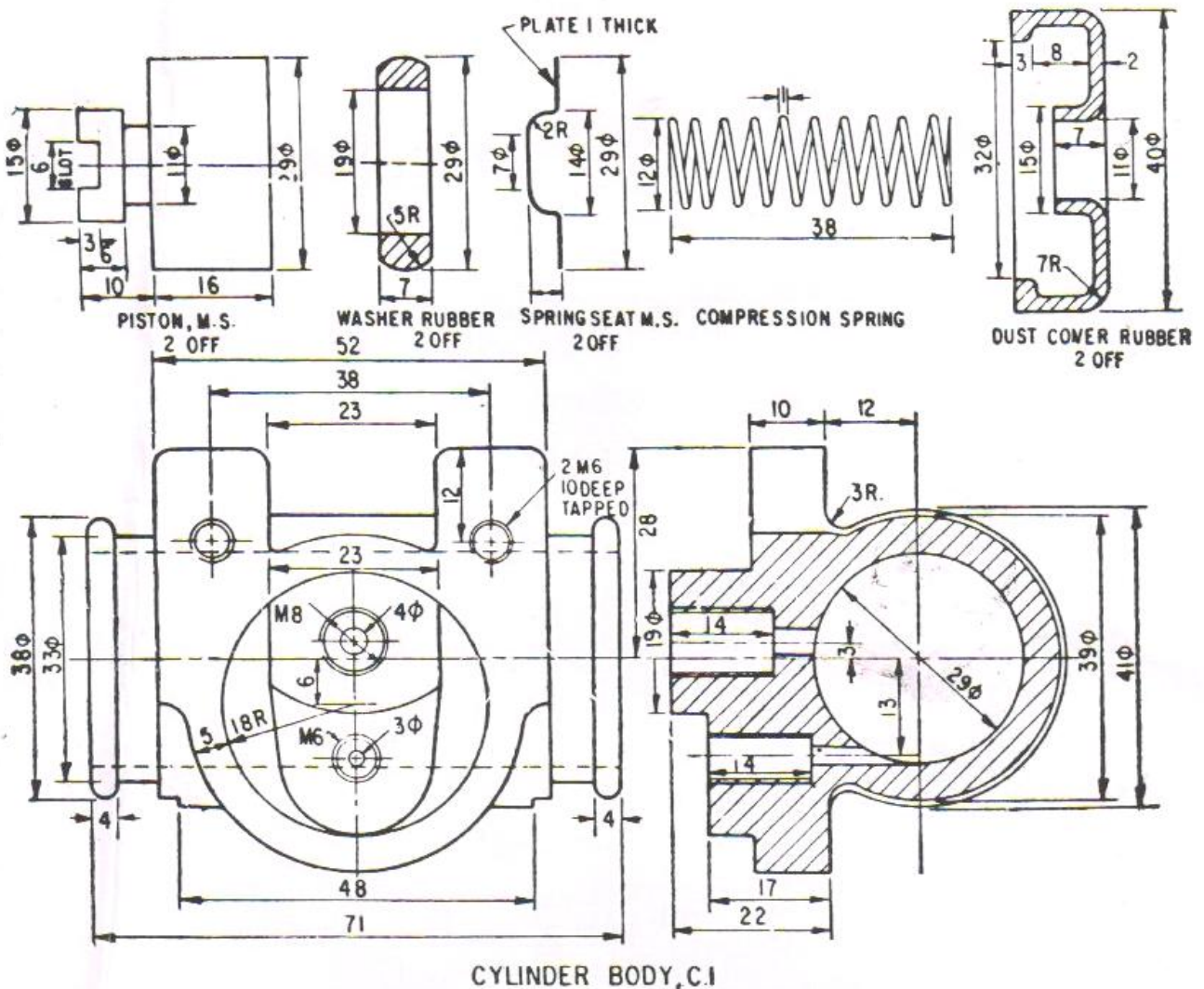
Time: 3 hours   **Max. Marks: 75**

Note: Answer all questions from Part-A and Part-B
Assume any missing data suitably and mention clearly

PART – A

1 Explain first angle projection and third angle projection, indicating the symbols to be used in each case.   (5M)
2 Sketch a Knuckle joint to connect two shafts of 20mm diameter.   (5M)
3 Sketch a Sleeve and Cotter joint to connect two rods of 25mm diameter.   (5M)
4 Draw unified thread and ACME thread when pitch = 10mm.   (5M)
5 Sketch with free hand a sectional front view and top view of a single riveted lap joint for two 10mm thick plates.   (5M)

PART – B

6 Assemble all the components shown in fig. to form wheel cylinder and draw
     a) Top view
     b) Sectional front view

CYLINDER BODY, C.I

Wheel cylinder details.

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FACULTY OF ENGINEERING
B.E. 2/4 (CSE) I - Semester (Main) Examination, November / December 2016

Subject : Logic and Switching Theory

Time : 3 Hours
Max. Marks: 75

Note: Answer all questions from Part-A and answer any five questions from Part-B.

PART – A (25 Marks)

1 Specify the ruler to be used to perform addition of two BCD numbers. (2)
2 Convert the octal number $(52.4)_8$ to its Binary and Decimal equivalent. (3)
3 Distinguish between Prime Implicant and Essential Prime Implicant. (2)
4 Realize the Even parity generator circuit. (3)
5 Write a VHDL code for 2 to 4 line Decoder. (3)
6 Draw a circuit diagram of a full-adder using Half-Adder. (2)
7 Draw the characteristic table and excitation table of a JK flip-flop. (3)
8 Draw the contact network for the function (2)
    $F(x, y, z) = \Sigma (1, 2, 4, 8)$
9 Distinguish between synchronous and asynchronous counter. (2)
10 Mention how a function can be symmetric with a suitable example. (3)

PART – B (50 Marks)

11 (a) Express the Boolean function $F = xy + x'z$ in a sum-of-product and product-of-sums form. (4)
   (b) Explain the significance of Parity bit. (3)
   (c) What do you understand by ASCII? (3)

12 Simplify the Boolean function using map method and draw the logic circuit. (10)
    $F(w, x, y, z) = \Sigma (0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$

13 Simplify the Boolean function by using Tabulation method and draw the logic diagram.
    $F(A, B, C, D) = \Sigma (0. 1. 2. 8. 10. 11. 14, 15)$ (10)

14 Design a BCD-to-Excess-3 code converter with a circuit diagram. (10)

15 (a) Design a 3-to-8 Decoder using 2-to-4 decoders. (5)
   (b) Write a VHDL code for 4-to-1 multiplier. (5)

16 Design a synchronous mod-10 counter using D-flip-flop. (10)

17 Write short notes on the following:
   (a) Carry Look Ahead Adder (5)
   (b) Shift Registers (5)

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