FACULTY OF ENGINEERING

B.E. 2/4 (Civil) I – Semester (Suppl.) Examination, May / June 2017

Sub: Engineering Geology

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

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

PART – A (25 Marks)

1 Define rock. Write any four names of igneous rocks.

2 Write all the physical properties for the Mineral Talc with its special characteristics.

3 Explain various textures of igneous rocks.

4 Draw neat sketches of any two folds and label it.

5 Give the detail classification of soils in India.

6 Define the terms un-confined aquifer and confined aquifer with neat sketches.

7 Explain about schlumberger configuration in Electrical Resistivity method.

8 Describe the engineering properties for the following:

   a) Granite

   b) Sandstone

9 Explain geological consideration in selection of road aggregates.

10 Differentiate between earthquakes and landslide.

PART – B (5x10 = 50 Marks)

11 a) Discuss the scope and application of geological knowledge in the planning and execution of Civil Engineering Works.

   b) Explain in detail about the classification of sedimentary rocks.

12 a) Write a short note on the following:
     i) Dip and strike
     ii) Unconformity
     iii) Faults

   b) Explain various groundwater proviences of India with a neat sketch.

13 a) Describe the uses and limitations of Aerial photographs.

   b) Explain various types of Bore-hole drilling.

14 a) Explain the geological and engineering consideration in selection of Runway aggregates and Decorative stones.

   b) Define Dam. Label its parts, explain about various types of dams with neat sketches.

15 a) Write a short note on the following:
   - i) Tunnels in faulted region
   - ii) Tunnels in anticline and syncline.

   b) Explain the application of Remote Sensing and GIS technique in Civil Engineering projects.

16 a) Write a detailed note on the following:
   - a) Earthquake Resistant Structures
   - b) Tsunami warning systems
   - c) Foundation geology of Srisailam dam.

17 a) Discuss groundwater problems in major civil engineering projects.

   b) Discuss in detail various weathering processes that take place in nature.

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FACULTY OF ENGINEERING

B.E. 2/4 (EEE/Inst.) I – Semester (Suppl.) Examination, May / June 2017

Sub: Electrical Measurements and Instruments

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

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

PART – A (25 Marks)

1　Explain briefly the following
　i)　Zero drift
　ii)　Span drift
　iii)　Zonal drift　　　　　　　　　　　　　　　　　　　　　　　　　　3

2　An analog indicating instrument with a scale range of 0-10.0 V shows a voltage of 5.30 V.
　The true value of a voltage is 5.40 volts. Express the error as a function of the true value and full scale deflection.　　　　　　　　　　　　　　　2

3　An electrodynamic wattmeter has a voltage circuit of resistance of 8000　and inductance of 63.6 mH which is connected directly across a load carrying 8A at a 50Hz voltage of 240 V and pf of 0.1 lagging. Estimate the percentage error in the wattmeter reading caused by the loading and inductance of the voltage circuit.　　　3

4　List one instrument which does not require any controlling torque. Give reason.　　　2

5　What are the limitations of Desauty's bridge and how are they overcome by using a modified form of Desauty's bridge.　　　　　　　　　　3

6　Give reason why Maxwell's inductance and capacitance bridge is useful for measurement of inductance of coils having storage factor between 1 and 10.　　　2

7　List out the tests to be carried out on Ferromagnetic materials to eliminate the inaccuracies.　　　　　　　　　　　　　　　　　　　3

8　Give the reason why ballistic galvanometer should have large moment of inertia and small control spring constant. Justify.　　　　　　　　　2

9　Define the following terms as used for instrument transformers
　a)　Turns ratio
　b)　Burden　　　　　　　　　　　　　　　　　　　　　　　2

10　A slide wire potentiometer has a battery of 4 V and negligible internal resistance. The resistance of slide wire is 100　and its length 200 cm. A standard cell of 1.018 V is used for standardizing the potentiometer and the rheostat is adjusted so that balance is obtained when the sliding contact is at 101.8cm.
　a)　Find the working current of the slide wire and the rheostat setting.
　b)　If the slide wire has divisions marked in mm and each division can be interpolated to one fifth, calculate the resolution of the instrument.　　　3

PART – B (5X10 = 50 Marks)

11 a) Describe in details the construction and principle of operation of a transfer instrument generally used in laboratory for measurement of current. Give the equation for torque of the ammeter.   5

b) The Simpson multimeter model 260 uses a basic d'arsonval movement of 50μA with an internal resistance of 2000 . The multimeter ranges of this instrument are 0-2.5 V, 0-10 V, 0-50 V, 0-250 V, 0-1000 V and 0-5000 V. The instrument utilizes the potential divider arrangement. Calculate the resistance values of R_1, R_2, R_3, R_4, R_5 and R6.   5

12 a) The inductance of a moving iron ammeter with a full scale deflection of 90^0 at 1.5A is given by the expression:
L=180+40 -4 ^{2}- ^{3} μH
i) Spring constant   5
ii) The angular deflection of the pointer for a current of 1.0A.

b) A Wattmeter having a range of 2000W has an error of ± 1 percent of full scale deflection. If the true value is 200 W, what would be the range of the readings? If the error is specified as percentage of the true value, what would be the range of the readings?   5

13 a) Describe the construction of working of Weston type synchroscope.   5

b) A watthour meter is calibrated to measure energy on a 250 V. On test a steady current of 15 A is passed through it for 5 hours at unity power factor. If the meter readings before and after the test are 8234.21 kWh and 8253.13 kWh respectively, calculate the percentage error.If the spindle turns through 290 revolutions during 5 minutes when a current of 20 A is passing through the meter at 250 V and 0.87 power factor, calculate the meter constant.   5

14 a) The four arms of a bridge network are made as follows:
Arm *ab* : a resistor of 50 in parallel with an inductor of 0.1H; Arm *bc* : a resistor of 100 ; Arm *cd* : unknown resistor R in parallel with an unknown capacitor C; Arm da : a resistor of 1000 ; A 50Hz voltage supply is applied across *ac*. Find R and C when a vibration galvanometer connected across *bd* is undeflected.   6

b) A cable is tested by loss of charging method using a ballisitic galvanometer with the following results: discharged immediately after electrification, deflection 250 divisions; discharged 25 seconds after electrification (i) deflection 150 divisions (ii) when in parallel with a resistance of 7M deflection 100 divisions. Calculate the insulation resistance of the cable.   4

15 a) Explain the oscillographic method of determination of hysteresis loss of a magnetic material. 5

 b) Describe the Lloyd Fisher square method of measuring iron losses in ferromagnetic material. 5

16 a) Determine the ratio error and phase angle error in CT's? 6

 b) A basic slide wire potentiometer has a working battery voltage of 3.0V with negligible internal resistance. The resistance of slide wire is 400 and its length is 200 cm. A 200 cm scale is placed along the slide wire. The slide wire has 1 mm scale divisions and it is possible to read up to 1/5 of a division. The instrument is standardized with 1.018 V standard cell with sliding contacts at the 101.8 cm mark on scale. Calculate
 a) Working current
 b) Resistance of series rheostat
 c) Measurement range 4

17 Explain any two from the following

 a) Hall effect transducers

 b) Lissajous Figures.

 c) 3-$\varnothing$ Reactive power measurement using 1-$\varnothing$ wattmeter. 5+5

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FACULTY OF ENGINEERING
B.E. 2/4 (ECE) I - Semester (Suppl.) Examination, May / June 2017

Subject : Electronic Devices

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 Determine the AC resistance or dynamic resistance for semiconductor with a forward bias of 0.25V and I_0 is 1.2µA at room temperature.   (3)
2 Define Line regulation and Load regulation of a Zener diode.   (2)
3 Compare half, full and bridge rectifiers in terms parameters.   (3)
4 What is Critical inductance? Give the expression for critical inductance?   (2)
5 Distinguish between DC and AC load lines with suitable example?   (3)
6 Derive the general expression for stability factor S?   (3)
7 Define h-parameters and draw the small signal low frequency hybrid model of BJT.   (2)
8 What is UJT? Draw the symbol, construction diagram and equivalent circuit of UJT?   (2)
9 A JFET has Vp = -4.5V, I_{DSS} = 10mA and I_{DS} = 2.5mA. Determine the transconductance.   (3)
10 Explain how MOSFET acts as a switch?   (2)

PART – B (50 Marks)

11 (a) Derive the expression for Barrier potential near the PN junction?   (5)
    (b) What are the applications of PN junction diode?   (5)
12 (a) Explain the operation of bridge rectifier with neat circuit diagram, draw input and output waveforms and derive all performance parameters.   (5)

    (b) In bridge rectifier circuit, each diode has forward resistance of,R_f=5 ,transformer secondary resistance R_S=5 . V_{rms}=30 volts , I_L=200 mA. Calculate

    (i) Output DC voltage (ii) Output ripple voltage   (5)

13 (a) Describe an experimental set up to obtain the output characteristics of a CB transistor configuration. Indicate and explain the various regions of operation on the output characteristics.   (7)
    (b) A transistor has   = 0.98. If emitter current of the transistor is 1mA, find base current I_B and gain factor .   (3)

14 (a) Explain how stability is achieved in Self bias circuit with neat circuit diagram?

State advantages and disadvantages of self bias circuit? (5)

(b) Design a self bias circuit for a Si transistor having $V_{BE} = 0.6V$, =99. Desired

operating point is V_{CE}=5V and I_C=1mA. Assume Vcc=10V, Rc=3K and S=5. (5)

15 (a) A junction transistor has the following h-parameters $h_{ie} = 2000$, $h_{re} = 1.6 \times 10^{-4}$, $h_{fe} = 49$ $h_{oe} = 50\mu mhos$. Determine the A_I, A_V, Z_i, Zo of the CE amplifier using exact Analysis. Assume load resistance R_L as 30 and source resistance as 600 . (6)

(b) What are the differences between Depletion MOSFET and Enhancement MOSFET? (4)

16 (a) Explain the operation of depletion mode n – channel MOSFET? And draw

the drain and transfer characteristics. (7)

(b) Differentiate between drift and diffusion currents. (3)

17 Write short notes on the following. (10)
   (a) TRIAC
   (b) Zener diode as voltage regulator
   (c) Thermal Runaway

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FACULTY OF ENGINEERING

B.E. 2/4 (M / P) I – Semester (Suppl.) Examination, May / June 2017

Subject: Machine Drawing

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

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

PART – A (25 Marks)

1 Sketch the half sectional front view of a flanged coupling with detachable flanges.   5

2 Sketch a knuckle joint to connect two shaft of 25 mm diameter.   5

3 Draw the following views of the component shown in Fig. 1.   10

   i) Front view

   ii) Sectional side view.

4 Sketch two views of a hexagonal headed bolt of nominal diameter D = 25 mm, with a
   net and washer in position. Indicate proportions in terms of D.   5
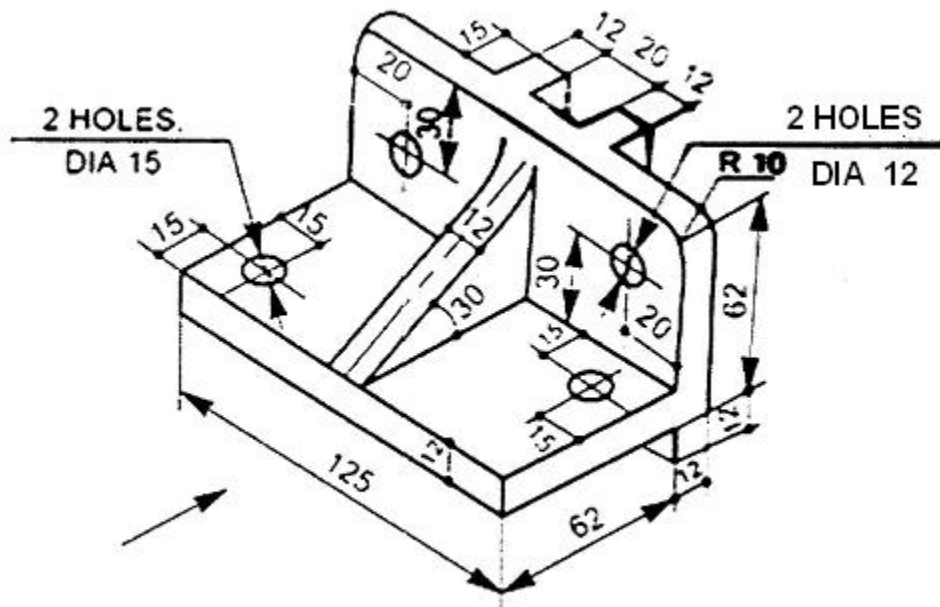
Fig. 1

PART – B (50 Marks)

5 Assemble all the components shown in Fig. 2 to form Ram's bottom safety valve, and
   draw.
   i) Sectional front view and   30
   ii) Sectional left side view   20

…2.

Parts list

Part No.	Name	Matl	Qty
1	Housing	CI	1
2	Eye bolt	MS	1
3	Link	MS	2
4	Valve seat	Gunmetal	2
5	Valve	Gunmetal	2
6	Pivot	MS	1
7	Pin	MS	3
8	Split pin	MS	3
9	Lever	MS	1
10	Spring	Spring steel	1
11	Washer	MS	1
12	Lock-nut, M20, 12 Thick	MS	1
13	Nut, M20, 20 Thick	MS	1

Fig. 2

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FACULTY OF ENGINEERING

B.E. 2/4 (AE) I – Semester (Suppl.) Examination, May / June 2017

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. List different types of lines used in engineering drawing and give their applications.   (5M)

2. Sketch Oldham coupling to join two equal shafts of 30mm diameter.   (5M)

3. Sketch with free hand, a square-headed bolt having 20mm shank diameter (both front view & side view).   (5M)

4. Sketch two views of a castle nut for a 10mm metric screw indicating the split pin position.   (5M)

5. Draw a free hand sketch of double riveted, double strap, zig-zag butt joint for two 10mm thick plates.   (5M)

PART – B
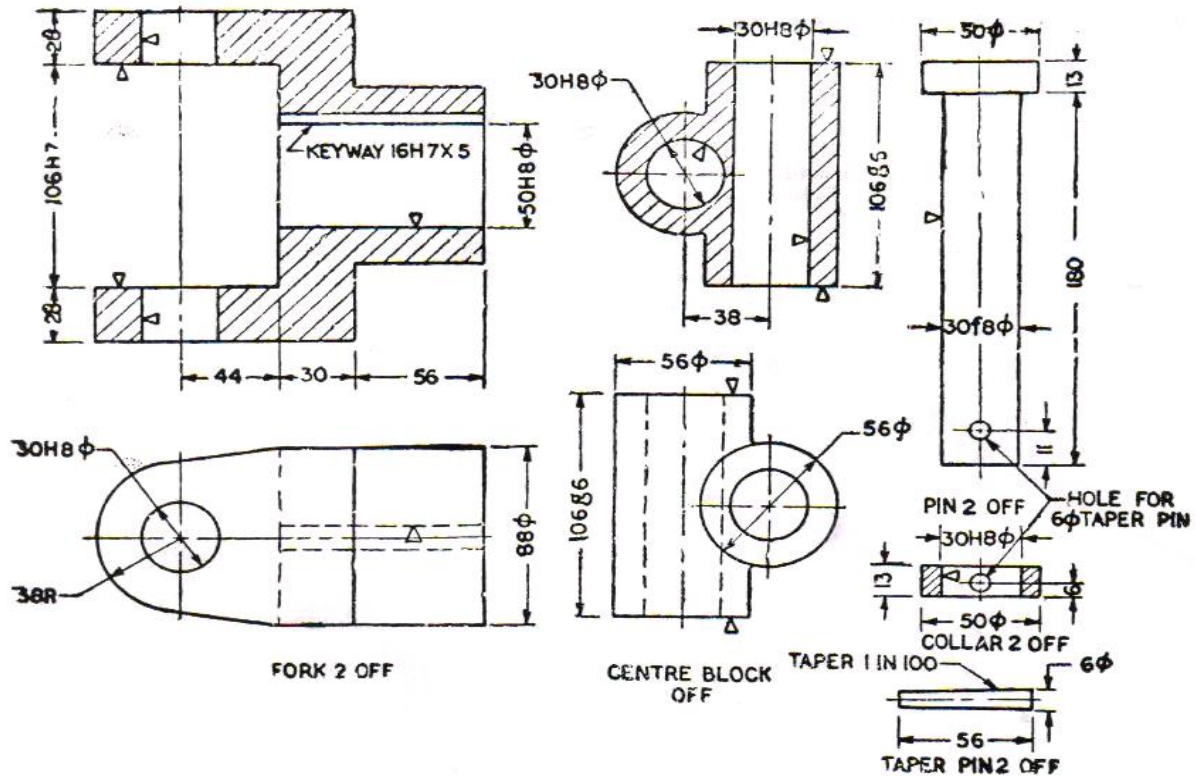
6   Assemble all the components shown in fig. to form universal coupling and draw
   a) Top view   20
   b) Sectional front view   30

Universal Coupling (Details)

Material list—Universal coupling

S. No.	Part's name	Material	No. off
1	Forks	C.I.	2
2	Centre block	C.I.	1
3	Pin	M.S.	2
4	Taper pin	M.S.	2
5	Collar	M.S.	2

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FACULTY OF ENGINEERING
B.E. 2/4 (CSE) I - Semester (Suppl.) Examination, May / June 2017

Subject : Computer Architecture

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 What is a direct instruction?   (2)
2 An eight bit register contains the binary value 11011111. What is the value in the
   register after an arithmetic shift left? Is there an overflow?   (2)
3 What is micro instruction format? Explain   (3)
4 How is the effective address calculated in "Index Addressing Mode"?   (2)
5 Define pipelining.   (2)
6 What is an array multiplier?   (3)
7 What is a data communication processor? Explain.   (3)
8 What is asynchronous data transfer?   (3)
9 What do you understand by Auxilliary memory? Explain.   (3)
10 An address is specified by 20 bits and the corresponding memory space is 16 bits.
   Calculate the number of words in the address space and memory space.   (2)

PART-B (25 Marks)

11 (a) Draw the diagram for 4-bit arithmetic circuit with 4 full adders circuit with 4-bit adders
       and 4 multiplexers for choosing different operations.   (5)
   (b) Explain the instruction cycle with an example   (5)
12 (a) Explain in detail general register organization of a computer.   (5)
   (b) Write an assembly language program to perform W= (A*B*C/D+A) * (B-A) using
       three/two/one and zero instructions.   (5)
13 (a) Explain the process of addition/subtraction using 2's compliment number.   (5)
   (b) Explain Booth's algorithm with an example.   (5)
14 (a) Discuss in detail about Programmed I/O and Interrupt driven I/O.   (5)
   (b) With the help of a block diagram, explain in detail, the mechanism of data
       transfer between a peripheral device and memory in CPU.   (5)
15 (a) Explain two way set associate mapping of cache memory with an example   (5)
   (b) Explain in detail about associative memory.   (5)
16 (a) Explain in detail the design of a basic computer.   (5)
   (b) Differentiate between RISC and CISC.   (5)
17 Write short notes on :   (10)
   (a) Memory interleaving
   (b) Input output processor
   (c) Virtual memory

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FACULTY OF INFORMATICS

B.E. 2/4 (IT) I - Semester (Supplementary) Examination, May / June 2017

Subject : Electrical Circuits and Machines

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 Ohm's law.	2
2 The voltage expression given by $v = 200 \sin (314\,t)$ V. Determine maximum value of voltage and frequency.	3
3 Give the constructional details of 1 – phase transformer.	3
4 What is meant by balanced 3 – phase supply system.	2
5 Draw pictorial view of DC machine and mention various parts.	3
6 Mention the application of DC series motor.	2
7 Define slip and synchronous speed of an 3 – phase induction motor.	2
8 How rotating magnetic fields is produced in 3 – phase induction motor?	3
9 What are the advantages of BLDC motors over conventional DC motors.	2
10 Give the basic principle of stepper motor.	3

PART – B (50 Marks)

11 a) For the circuit shown below, find the current I_x.   5
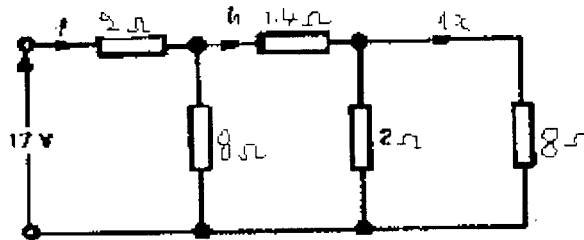
b) State and explain Norton's theorem.   5

12 a) Explain equivalent circuit of a 1 – phase transformer referred to primary and secondary.   4

b) A transformer takes a current of 0.8 A when its primary is connected to a 240 volt, 50 Hz supply, the secondary being on open circuit. If the power absorbed is 72 watts, determine   a) the iron loss current, b) the power factor on no-load, and   c) the magnetizing current.   6

13 a) Two wattmeters connected to a 3-phase motor indicate the total power input to be 15 kW. The power factor is 0.8 lagging. Determine the reading of each wattmeter.   4

b) Derive the expression for relation between phase and line voltages of 3 – phase star connection.   6

14 a) Explain constructional details and principle operation of DC motor.   5

b) A 200 V, d.c. shunt-wound motor has an armature resistance of 0.4 Ω and at a certain load has an armature current of 30 A and runs at 1350 rpm. If the load on the shaft of the motor is increased so that the armature current increases to 45 A, determine the speed of the motor, assuming the flux remains constant.   5

15 a) The power supplied to a three-phase induction motor is 32 kW and the stator losses are 1200 W. If the slip is 5%, determine   i) the rotor copper loss, ii) the total mechanical power developed by the rotor,   iii) the output power of the motor if friction and windage losses are 750 W, and iv) the efficiency of the motor, neglecting rotor iron loss.   6

b) Draw and explain slip torque characteristics of an 3 – phase induction motor.   4

16 a) Explain constructional details and principle operation of BLDC motor.   5

b) Explain the principle operation of capacitor run motor with neat schematic diagram and mention its applications.   5

17 a) Derive the emf equation of a DC machine.   5

b) Define the active power, power factor, frequency, form factor and impedance.   5

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