B.E / B.Tech. PRACTICAL END SEMESTER EXAMINATIONS, NOV/DEC 2022

Third Semester

EC3311- ELECTRONIC DEVICES AND CIRCUITS LABORATORY

(Regulations 2021)

Time : 3 Hours | Answer any one Question | Max. Marks 100

Aim/Principle/Apparatus required/Procedure	Tabulation/Circuit/ Program/Drawing	Calculation & Results	Viva-Voce	Record	Total
20	30	30	10	10	100

1. Construct a PN junction diode circuit in both forward and reverse directions and plot the V-I characteristics. Find cut in voltage (knee voltage), static and dynamic resistance in forward direction. Find static and dynamic resistance in reverse bias condition.

2. Construct a Zener diode circuit in reverse bias condition and plot the V-I characteristics. Find Zener breakdown voltage in reverse bias condition, find static and dynamic resistance in both forward and reverse bias conditions and perform Zener diode voltage regulator.

3. Determine the reverse current-illumination curve and reverse voltage-reverse current curve characteristics of a photodiode.

4. Construct a photo transistor circuit and plot the V-I characteristics indicating that current is increasing with the intensity of the radiation

5. Design a NPN common base transistor configuration and plot the input and output characteristics of a transistor. Calculate the input resistance Ri, output resistance Ro and current gain.

6. Design a NPN common emitter transistor configuration and plot the input and output characteristics of a transistor. Calculate the input resistance Ri, output resistance Ro and current gain.

7. Design a NPN common collector transistor configuration and plot the input and output characteristics of a transistor. Calculate the input resistance Ri, output resistance Ro and current gain.

8. Construct a common drain JFET circuit and plot its characteristics. Find drain resistance r_d, transconductance gm, voltage gain, bandwidth and also draw its equivalent circuit.

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$r_{d,}$ transconductance gm, voltage gain, bandwidth and also draw its equivalent circuit.

9. Construct a common source JFET circuit and plot its characteristics. Find drain resistance $r_{d,}$ transconductance gm, voltage gain, bandwidth and also draw its equivalent circuit.

10. Construct a silicon-controlled rectifier circuit and determine the breakover voltage, peak reverse voltage, holding current from the Volt-ampere characteristics of silicon-controlled rectifier.

11. Construct a UJT circuit and determine the peak point, valley point, negative resistance region from the volt-ampere characteristics of UJT.

12. Design and construct a half wave rectifier without and with filters and examine the input and output waveforms. Calculate the ripple factor with load resistance 10 KΩ respectively. Calculate ripple factor with a filter capacitor of 100μF and the load of 10KΩ respectively.

13. Design and construct a full wave rectifier without and with filters and examine the input and output waveforms. Calculate the ripple factor with load resistance 10 KΩ respectively. Calculate ripple factor with a filter capacitor of 100μF and the load of 10KΩ respectively.

14. Design a light activated switch circuit using LDR to control an electrical appliance based on intensity of the light.

15. Construct a RC phase shift oscillator using NPN transistor and calculate the frequency of oscillation

16. Construct a Hartley oscillator using NPN transistor and calculate the frequency of oscillation

17. Construct a Colpitts oscillator using NPN transistor and calculate the frequency of oscillation

18. Design a Differential amplifier using FET and calculate the differential gain Ad, common mode gain Ac and CMRR of the amplifier.

19. Determine the frequency measurement and phase angle using CRO using Lissajous Patterns

20. Design a first order low pass filter circuit using passive elements and determine its cut

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off frequency f_c

21. Design a first order high pass filter circuit using passive elements with cut off frequency f_c of 10KHZ.

22. Design a first order band pass filter circuit using passive elements with f_L and f_H and determine its 3db filter bandwidth.

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B.E / B.Tech. PRACTICAL END SEMESTER EXAMINATIONS

Sixth Semester

CE8612 & IRRIGATION AND ENVIRONMENTAL ENGINEERING DRAWING

(Regulations 2017)

Time : 3 Hours | Answer any one Question | Max. Marks 100

Design	Drawing	Viva-Voce	Record	Total
40	40	10	10	100

1. Design the surplus work of the tank farming a part of chain of tanks the combined catchments area of the group of tanks is 25.89Km² and the area of the catchments intercepted by the upper tank is 20.71Km². It is decided store water in the tank to a level of +12.00m above MSL (mean sea level) limiting the submersion of the foreshore land up to a level of +12.75m above MSL. The general ground level of the proposed site work is +11.00m and the ground level below the surplus slope of till it reaches +10.00m in land above 6m distance. The tank bund has the top width of 2m at level +14.50m with 2:1 side slope on either side, the tank bunds are designed for saturation gradient of 4:1 with 1m clear cover. The foundations are of hard gravel at a level of 9.50m near the site of work. Draw plan and longitudinal section and elevation.

2. Design a canal drop of 2m with the following data

Hydraulic particulars of the canal above drop:

Full supply discharge 4m³/sec, Bed width is 6m, Bed level is +10.00, Full supply depth: 1.5m, FSL +11.50, Top of bank 2 m wide at level +12.50, Half supply depth is 1m

Hydraulic particulars of the canal below drop:

Full supply discharge 4m³/sec, Bed width is 6m, Bed level = +8.00, Full supply depth: 1.50m FSL +9.50, Top of bank 2 m at level +10.50.the ground level at the site of work is +10.50. Good soil is available for foundation at +8.50. Draw plan and longitudinal section.

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3. Design a road cum bridge regulator with the following data

Hydraulic particulars of canal upstream:

Full supply discharge =20m³/sec, Bed width is 15m, Bed level is +20.00, Full Supply depth is 2 m, FSL is +22.00, Top level of bank - +23.00,The right bank is 5m wide, left bank is 2m wide

Hydraulic particulars of canal downstream

Full supply discharge =16m³/sec, Bed width is 15m, Bed level is +20.00, FS depth is1.75m

FSL +21.75 , Top level of bank - +22.75, The right bank is 5m wide, left bank is 2m wide

The regulator carries a road way single lane designed for IRC loading class'A'. Provide clear free board of 1m above FSL for road bridge. Good foundation soil available at +19.00 GL at site at +22.00. Draw the plan and half sectional elevation.

4. Design a Tank Sluice with Tower Head for the following hydraulic particulars

Ayacut =63.6 hectares, Duty = 723 hact/cumec, Top Width of Bund= 1.80 m

Front Slope =11/2:1, Rear Slope = +2:1, Tank Bund Level = +20.20m, Maximum Water Level = +18.90m, Full Tank Level= +18.30m, Highest Flood Level= +14.60m

Lowest Flood Level= +12.20m, Assume any other relevant data

Wing walls are constructed on the upstream side of the bund for regulating through a well of 1.20m diameter. Revetment is 45cm over gravel packing of 15mm thick. Draw the following views to a suitable scale Half plan at top and half plan at the foundation level and Front Elevation

5. The following details refer to the particulars of a canal to be taken across the drain.

CANAL: Bed width is 15m, Bed Level is +25.00m,Depth of F.S.L is 2m, Discharge is 20m3/sec, Side Slope is 11/2:1

DRAIN: Bed width is 25m, Bed Level = +23.20m, M.F.L = +25.20m, Discharge = 70m³/sec, Side Slope is 11/2:1, General G.L = +25.00m

Maximum allowable velocity in the canal = 1.5 m/s

Maximum allowable velocity in the drain = 2.5 m/s

Design syphon aqueduct for the above data. Draw plan and longitudinal section and elevation

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A direct sluice taking off from a main canal irrigates 100 Hectares of land with a duty of 800.

6. Full discharge of canal - 500 cubic meters/second, Bed width - 25 meters, Full supply depth - 3 meters, Half supply depth - 2 meters, Bed level - + 10.00m, F.S.L - +13.00, Ground level - +12.00

Top level of bank +14.00 with a top width of 5.00meters.

There is a berm, of 2m width at ground level inside the canal section. The canal has 1 to 1 Side slopes in cutting and 2:1 side slopes in embankment.

Hydraulic Particulars of the distributary

Bed level of the distributary +11.50, Bed width 1 meter, Full supply depth 0.50 meter F.S.L +12.00, Top level of bank +12.75, Top width 1 meter, Hard soil available at +11.50 Design the Head sluice with the above particulars. Draw plan and sectional elevation

7. Design a suitable cross drainage work for the following data at the crossing of a canal and drainage.

For canal: full supply discharge = 32 cumecs, full supply level = +213.50 , canal bed level= +212.00, canal bed width=20m,canal water depth =1.5m .provide trapezoidal canal section with 11/2:1 slope.

For drainage: high flood discharge= 300 cumecs, high flood level=+210.00, water depth =2.5m , GL=+212.50. Draw plan and sectional elevation

8. Design and draw a rapid sand filter for a 4 million litres/day with all its principle components Assume suitable data where ever necessary

9. Design and draw coagulation cum sedimentation tank with continuous flow for a population of 60000 persons with a daily per capita water allowance of 120 liters. Make suitable assumptions where needed.

10. Design and draw a flocculator for a flow of 300m^3/hr .Assume suitable permissible values of various parameters of design wherever necessary.

11. Design and draw a screen chamber for the data given below. Max flow rate =0.42m^3/s, Average flow =0.21 m^3/s, Minimum flow= 0.084m^3/s. Assume suitable data where ever necessary.

12. A rectangular grid chamber is designed to remove particles with a diameter of 0.2mm, specific gravity 2.65 setting velocity for these particles has been found to range from 0.016 to 0.022 m/s depending on this shape factor. A flow through velocity of 0.3m/s will be maintained by proportioning weir. Determine the channel dimensions for a maximum waste water flow of 10000 m^3/day. Draw plan and Longitudinal view.

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13. Design and Draw septic tank for 120 persons. Assume per capita sewage as 140 lpcd. Cleaning period= 1 year L: B=4:1 percolation rate in soak well =1300 l/m3/day. Detention period=24 hours

14. Design and draw a digestion tank for the primary sludge digestion with the help of following data. Average flow= 20MLD. Total suspended solids in raw sewage= 300mg/l. Moisture content of the digested sludge=85%. Assume any other data that is required.

15. Design and draw sludge drying beds by assuming solid loading rate of 100 kg/m^2/annum, if the design population is 1 lakh and expected total solids in the digested sludge is 57 GPCD.

16. Design and draw a flash mixer for a flow rate of 1.7m^3/s. Assume suitable data where ever necessary. Draw the plan and sectional view of the flash mixer.

17. Design a raw water pumping station for obtaining water from perennial river with the following data. Population to be served =5lakhs, daily demand for water=150lit per person per day, summer requirements= 150% of average, normal water level in river =RL 202.00.m, low water level in river = RL 199.50m. The water is to be pumped in two shifts of 10hrs each daily and lifted to the inlet of water treatment plant situated nearby at RL 217.00m. The losses due to friction in the CI rising main of 0.9m diameter are low due to its short length and can be assumed to be 2 m in summer season. The efficiency of the pumps and the driving motor can be taken as 75% and 90% respectively. Draw plan and sectional elevation.

18. Design and draw a concrete gravity dam for following data maximum allowable compressive stress =3000 KN/m^2. Maximum reservoir level=200m. R.L of bottom of dam =105m, specific gravity of dam material =2.4

19. Design and draw a septic tank with soak pit for a hostel of 300 persons with average daily sewage flow of 120litres/head/day. Assume suitable data where ever necessary

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