

# PURBANCHAL UNIVERSITY

**2018**

Bachelor in Information Technology (B.I.T.)/Second Semester/Final

Time: 03:00 hrs.

Full Marks: 80/Pass Marks: 32

**BIT130EC: Electronic Devices & Circuits (New Course)**

*Candidates are required to give their answers in their own words as far as practicable.*

*Figure in the margin indicate full marks.*

## Group A

**Answer TWO questions.**

**2×12=24**

- 1(a) Explain the forward bias operation of a PN junction diode with necessary diagrams and characteristic curve. 6
- (b) What is function breakdown? Explain the zener and avalanche breakdown. 6
2. Explain the configurations of BJT with necessary diagrams and characteristic curves. 12
- 3(a) Explain DE MOSFET. Include the necessary diagrams and characteristic curves. 7
- (b) Describe the operating principle of an oscillator with necessary diagram. 5

## Group B

**Answer SEVEN questions.**

**7×8=56**

4. What is intrinsic and extrinsic type of semiconductor? Describe the types of extrinsic semi-conductors. 8
5. What is biasing? Explain its need. 8
6. Explain the different types of voltage and current controlled sources. 8
7. Explain how op-amp can be used as an integrator and differentiator. 8
8. Derive the relation for the gain of non-inverting OP-AMP. Assume,  $R_i$  as input resistance and  $R_f$  as feedback resistance. 8

(2)

9. Calculate the following for the circuit given below (fig 1). The supply voltage is 5V and diode is silicon based

8

- (i)  $I_d$       (ii)  $V_d$       (iii)  $V_{R1}$       (iv)  $V_o$

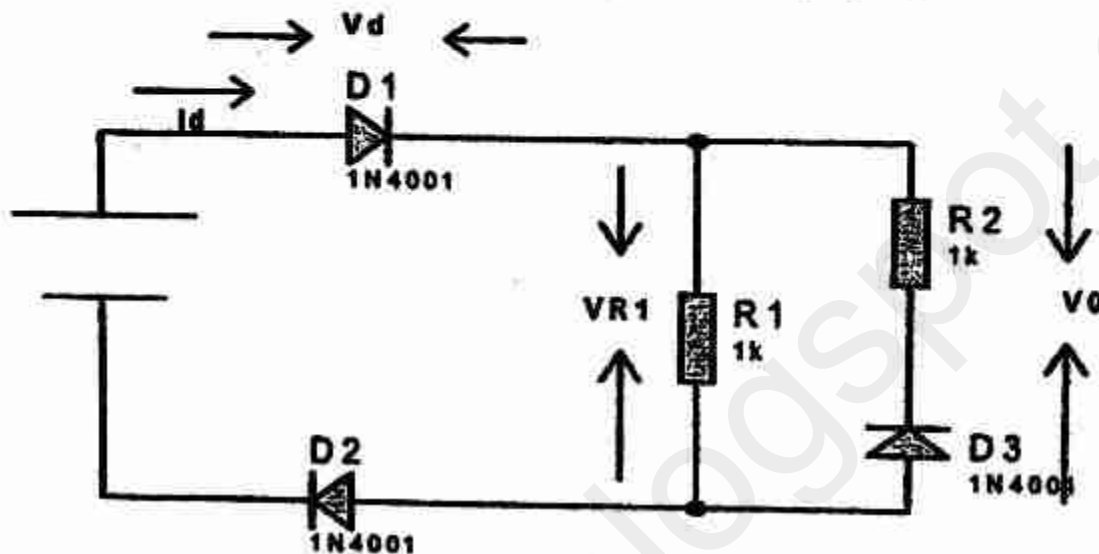


Fig 1.

10. What is pinch-off phenomena in JFET? What would happen if the pinch-off condition completely closes the path of current flow?

8

11. In an n-channel JFET biased by potential divider method, it is desired to set the operating point at  $I_D = 2.5\text{mA}$  and  $V_{DS} = 8\text{V}$ . If  $V_{DD} = 30\text{V}$ ,  $R_1 = 1\text{M}\Omega$  and  $R_2 = 500\text{K}\Omega$ , find the value of  $R_S$ . The parameters of JFET are  $I_{DSS} = 10\text{mA}$  and  $V_{GS(\text{off})} = -5\text{V}$ .

8

12. Write short notes on:

- (a) Relation between  $\alpha$  and  $\beta$ .  
(b) Schottky diode.

4+4

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**BIT176CO: Object Oriented Programming in C++ (New course)**

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*Figure in the margin indicate full marks.*

## Group A

**Answer TWO questions.**

**2×12=24**

- ✓ 1(a) Define access modes within a class. How can we access the class member? List out the characteristics of friend function. 2+2+2
- ✓ (b) Write a program to demonstrate constructor overloading. 6
- ✓ 2(a) Define operator overloading with general rules. Explain types conversion and write a program for overloading the assignment operator. 3+3+6
- 3(a) What are major and essential feature that make program object oriented. If a base and derived class each include a member function with same name, which member function will be called by an object of a derived class, and why? Explain with an example. 1+5
- (b) What is abstract class? Write a program in c++ that implements the concept of multilevel inheritance. 2+4

## Group B

**Answer SEVEN questions.**

**7×8=56**

- ✓ 4 Discuss access specifier. Describe static data members and static member functions with a suitable program. 3+5
- ✓ 5 Define constant pointer and pointer to constant with a suitable example. Write a program to demonstrate conversion from one class to another class type without using constructor. 3+5



(2)

- ✓ 6. Discuss default argument. Write a program to find perimeter of a square, rectangle and circle using function overloading. 3+5
- ✓ 7. Explain polymorphism and compare compile time and run time polymorphism. Describe virtual and pure virtual function with an example. 8
8. Explain the role of seekg(), seekp(), tellg(), and tellp() functions in the process of random access in a binary file. How can we open a text file and read from it. 4+4
- ✓ 9. Define template. Write a program using function template to find the sum of first and last element of an array of size, N of type int and float. 2+6
- ✓ 10. What are advantages of the exception handling mechanism? Explain the components of exception handling mechanism with suitable example. 8
- ✓ 11. Write short notes on any TWO: 2×4=8
- (a) Abstract class
  - ✓ (b) Arrays in c++
  - ✓ (c) New and delete operator



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2017

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**BIT176CO: Object Oriented Programming in C++ (New course)**

*Candidates are required to give their answers in their own words as far as practicable.*

*Figure in the margin indicate full marks.*

## Group A

**Answer TWO questions.**

**2×12=24**

- 1(a) Explain features of OOP. 4
- (b) Write a program to add two objects of a class using friend function. The class consists of hour and minute as its data member, input (), sum () and output () as its member functions. 8
- 2(a) What do you mean by type conversion? Explain its types. 2+4
- (b) What is Inline function? Using inline function, write a program to add two integers and return sum. 2+4
- 3(a) What is access specifier? Discuss its types. 1+3
- (b) Suppose an electronic store sells ten types of mobile phone. Each phone has its own model number, screen size, RAM size and price. Write a program to create a file named "mobile.txt" that store information for ten mobile phones and display all the information. 8

## Group B

**Answer SEVEN questions.**

**7×8=56**

4. Write a program with an overloaded function calc\_area() that calculates and returns area of circle and rectangle. Assume appropriate number and type of arguments and return type. 8
5. What are the roles of constructor and destructor? Write a program to demonstrate parameterized and copy constructor. 3+5



(2)

6. Mention rules for overloading an operator. Write a program to convert class type of data into basic type. 2+6

7. Assume that a bank maintains two kinds of accounts for customers, one called as savings account and the other as current account. The savings account provides compound interest at the annual rate of 10 %. Current account holders get simple interest of 5% per year. Create a class account that stores customer name and account number. From this, derive the classes: current\_account and saving\_account. Include necessary member functions and calculate the total amount of money in an account for both types of customers. 8

8. When do we use virtual function? Differentiate early and late binding. 4+4

9. Write a program to sort N numbers in ascending order using a function template. 8

10. Explain different types of inheritance with their syntax. 8

11. What do we need exception handling? Explain with an example. 8

12. Write short notes on any TWO:

2×4=8

(a) Static data members and static member functions

(b) This pointer

(c) Namespaces



# PURBANCHAL UNIVERSITY

2017

Bachelor in Information Technology (B.I.T.)/Second Semester/Final

Time: 03:00 hrs.

Full Marks: 80/Pass Marks: 32

**BIT191MS: Financial Management & Accounting (New Course)**

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

## Group A

Answer TWO questions.

2×12=24

1. A Company is considering the purchase of a machine. Two machines are available and each machine costing Rs. 10,000. Each machine has expected life of 4 years. The cost of capital is 12%. Net cash flow during the expected life of the machinery is given below.

Year	Machine A	Machine B
1	Rs.4500	Rs.3500
2	3500	3500
3	3500	3500
4	3000	3500

Required: (a) Net present value (b) The internal rate of return  
(c) Payback period.

2. Define Financial Management. Briefly explain about the objectives of financial management.

3. Given below is the trail and balance of a Raj and Brothers as on 30<sup>th</sup> chaitra 2072::

Particulars	Debit (Rs)	Credit(Rs)
Capital		300,000
Purchase	400,000	
Opening Stock	350,000	
Purchase return		10,000
Sales		690,000
Sales return	10,000	

(2)

Carriage outwards	10,000	
Debtors	42,000	
Creditors		30,000
Advertisement Expenses	4,000	
Discount	2,000	
Insurance paid	10,000	
Salaries paid	65,000	
10% bank loan		80,000
Interest on bank loan	4,000	
General Expenses	20,000	
Wages	40,000	
Carriage inward	8,000	
Furniture	50,000	
Rent paid	40,000	
Bank and cash balance	55,000	
Total	11,10,000	11,10,000

**Additional Information:**

- (a) Closing stock Rs. 3,75,000
- (b) Bad debts Rs 2000.
- (c) Provide reserve for bad debts 5% on debtors.
- (d) Advance salaries paid Rs 5000.
- (e) Outstanding wages Rs. 2000.
- (f) Bank loan was taken at the beginning of the year.
- (g) Depreciation on furniture at 10% p.a.

**Required:**

- (a) Trading Account      (b) Profit and loss Account
- (c) Balance Sheet as on 30<sup>th</sup> Chaitra 2072.

**Group B**

**Answer EIGHT questions.**

**8×7=56**



Show the accounting equation on the basis of following transactions:-

- (a) Commenced a business with bank balance Rs. 80,000.
- (b) Paid for commission by cheque Rs. 5000.



- (c) Withdraw from bank for office use. 2000.
- (d) Purchased goods from Srijana of Rs. 10,000.
- (e) Cash drew from bank for private use Rs. 4000.
- (f) Purchase machinery for cash Rs. 30,000.
- (g) Rent received Rs 5000 and still to be received Rs 2000.

5. What do you mean by time value of money? Explain its importance.

**OR**

Following are the information relating to a firm:

Annual requirement - 60,000 units

Ordering cost per order - Rs. 300

Cost per unit - Rs. 20

Carrying cost per unit 20% of average inventory

**Required:**

- (a) EOQ
- (b) No. of order
- (c) Total cost of EOQ

6. The following is provided:

Inventory	Rs. 30,000	Bill receivable	10,000
Creditors	Rs. 20,000	Fixed assets	50,000
Debtors	Rs. 250,000	Debtor turnover ratio	6 times
Cash in hand	Rs. 5,000	Gross profit	20,000

**Required:**

- (a) Current ratio
- (b) Quick ratio
- (c) Sales amount
- (d) Fixed assets turnover ratio

7(a) You will require Rs 1000 in 6 years. If you earn 7% interest on your funds, how much will you need to invest today in order to reach your saving goal?

(b) Which amount is worth more at 14 percent: Rs 7000 in hand today or Rs. 14000 due in six years?

X The balance sheet and income statement of a company ltd are as under:

(4)

Liabilities	2013	2014	Assets	2013	2014
Share Capital	100000	200000	Plant & machinery	160000	200000
Share Premium	10000	20000	Investments	30000	60000
10 % debenture	50000	-	Account receivable	50000	40000
Bills payable	30000	20000	Inventory	10000	25000
Account payable	40000	70000	Cash at Bank	30000	50000
P/L Account	70000	90000	Prepaid Expenses	20,000	25,000
	3,00,000	4,00,000		3,00,000	4,00,000

**Additional Information:**

Contd. ...

- (a) Sales Revenue Rs.3,00,000.
- (b) Cost of goods sold Rs.2,00,000.
- (c) Administrative & other operating cost Rs15,000.
- (d) Debenture Interest Rs.5,000.
- (e) Depreciation on Plant and Machinery Rs.30,000.
- (f) Plant having Book value 30,000 sold at a loss Rs.5,000.
- (g) Dividend paid Rs.25,000.
- (h) Plant Purchased during the period Rs.1,00,000.

**Required:** Cash flow from operating activities.

Consider the following transactions:

- May 1 Started a business with cash Rs 40,000 and Furniture Rs. 25,000.
- 2 Cash deposited into bank Rs. 50,000.
- 11 Goods purchased from Nivan of Rs.15000.
- 18 Sold goods to Ram on credit for Rs. 1000.
- 25 Cash received from Ram Rs 900 in full settlement of Rs. 1000.
- 28 Cash paid to Nivan Rs.14500 in full settlement of his account.

**Required: Double column cash book**

A Ltd. Company prepares business budget to exercise control over operations. The sales figure and purchase figure for recent month and expected for next month are as follows:

Months	Sales	Purchase
Baishakh	Rs. 200,000	
Jestha	Rs.300,000	Rs.175,000
Asad	Rs.350,000	Rs.300,000

Contd. ...

(5)

Credit sales are 80% of total sales, 50% of credit sales are collected in the following month and balance 50% in the next following month of sales. All purchase are credit purchase payable in the following month of purchase. Bank loan paid for Ashad is Rs. 60,000 and interest paid Rs. 6000. Other expenses payable in Ashad is Rs. 50,000. Wages due for Ashad but payable in next month Rs. 30,000. Cash Balance on 31st Jestha 50,000.

**Required:** Cash budget showing cash receipts and disbursement of the month of Ashad.

- ✓ 11. What do you mean by dividend policy? Explain the different factors affecting Dividend Policy.
- ✓ 12. Briefly explain the factors which affect capital structure decisions.
- ✓ 13. Write short notes on any TWO:
  - ✓ (a) Working capital management
  - (b) Rules of Double entry system
  - (c) Meaning of ratio analysis
  - ✓ (d) Stock dividend





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## Group A

Answer TWO questions.

2×12=24

1(a) Explain how does PN junction diode behaves under (i) Forward Bias (ii) Reverse Bias, with necessary diagrams and characteristic curves.

7

(b) Calculate the following for the circuit as shown in fig 1:

5

(i)  $V_{CC} = 12V$  (ii)  $V_E$  (iii)  $V_B = V_{TH}$  (iv)  $I_{CQ} = \beta I_B$  (v)  $I_{BQ}$

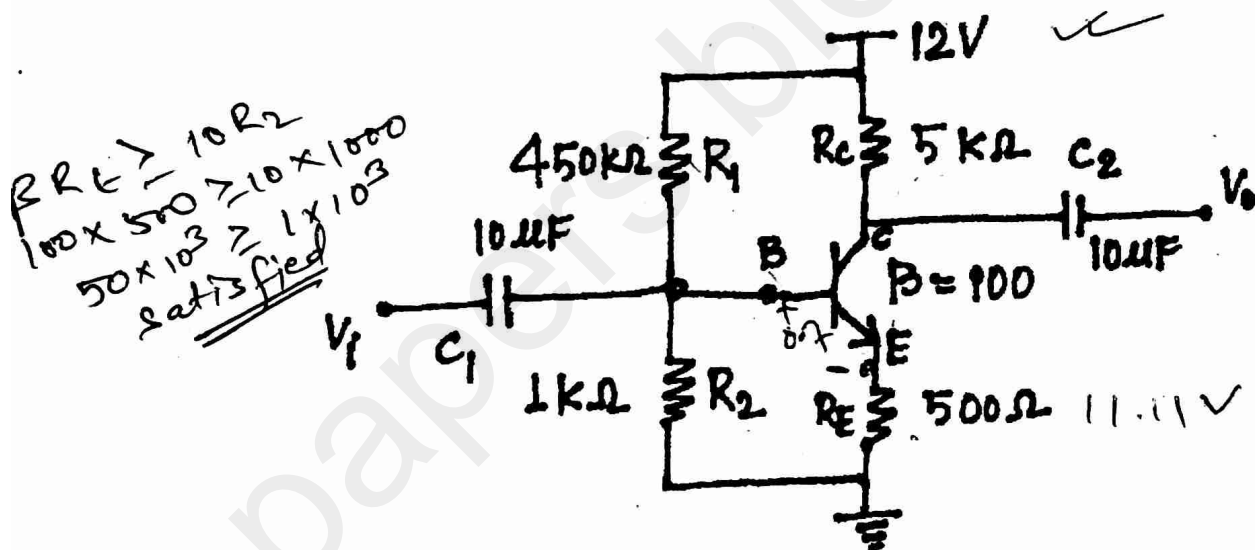


Fig. 1

2. Explain the configurations of BJT with necessary diagrams and characteristic curves.

12

3(a) Explain the Enhancement N-type MOSFET. Include the necessary diagrams and characteristic curve.

7

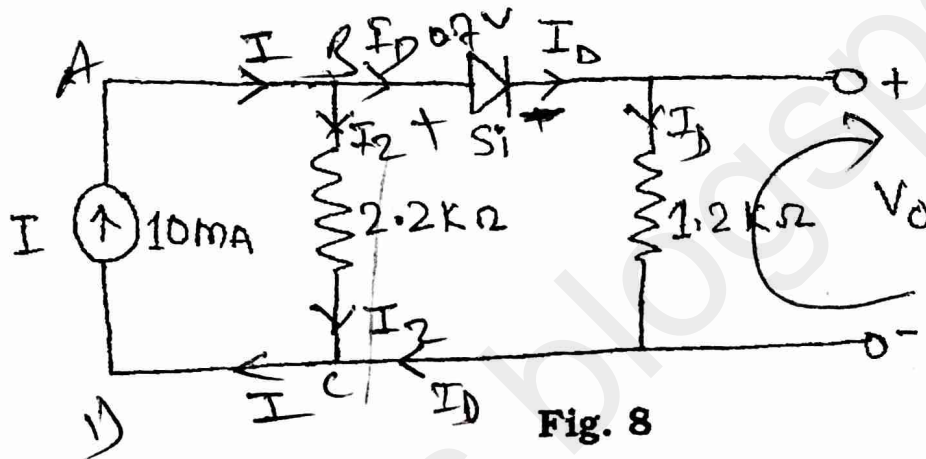
(b) What is feedback? Explain the types of feedback configuration.

2+3

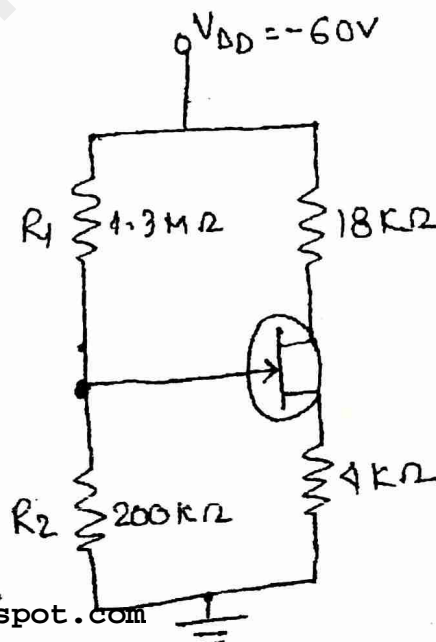
Answer SEVEN questions.

7×8=56

4. ✓ What is intrinsic and extrinsic type of semiconductor? Describe the types of extrinsic semi-conductors. 3+5
5. ✗ Draw the circuit diagram of a non inverting amplifier and derive the expression for voltage gain. 4+4
6. ✓ Explain the full wave bridge rectifier using PN junction diode and derive the expression for efficiency. 5+3
7. ✓ Derive the relation for the gain of inverting OP-AMP. Assume,  $R_i$  as input resistance and  $R_f$  as feedback resistance. 8
8. ✓ Calculate  $V_O$  and  $I_D$  for the circuit shown in fig. 8. 4+4



9. ✓ Explain the pinch-off phenomena in JFET? What would happen if the pinch-off condition completely closes the path of current flow? 5+3
10. ✓ Consider the following circuit. Determine  $I_D$ ,  $V_{GS}$  and  $V_{DS}$  for  $I_{DSS} = 4mA$ ,  $V_P = 4V$ . 3+3+2



(3)

11

Explain the principle of Oscillation. Discuss the operation of wein-bridge oscillator.

4+4

4+4

~~12~~

Write short notes on any TWO:

(a) Thermal Runaway.

(b) Integrator using Op-amp.

(c) Avalanche Breakdown

