BIRLA INSTITUTE OF TECHNOLOGY
MESRA – 835215, RANCHI, INDIA

UG

Name: …… Roll No.: ……..

Branch: …… Signature of Invigilator: ……

Semester: IVth Date: 29/04/2022 (MORNING)

Subject with Code: **PE209 ENGG. ECONOMY, COSTING & ACCOUNTING**

Marks Obtained	Section A (30)	Section B (20)	Total Marks (50)

INSTRUCTION TO CANDIDATE

1. The booklet (question paper cum answer sheet) consists of two sections. First section consists of MCQs of 30 marks. Candidates may mark the correct answer in the space provided / may also write answers in the answer sheet provided. The Second section of question paper consists of subjective questions of 20 marks. The candidates may write the answers for these questions in the answer sheets provided with the question booklet.
2. The booklet will be distributed to the candidates before 05 minutes of the examination. **Candidates should write their roll no. in each page of the booklet.**
3. Place the Student ID card, Registration Slip and No Dues Clearance (if applicable) on your desk. All the entries on the cover page must be filled at the specified space.
4. Carrying or using of mobile phone / any electronic gadgets (except regular scientific calculator)/chits are strictly prohibited inside the examination hall as it comes under the category of unfair means.
5. No candidate should be allowed to enter the examination hall later than 10 minutes after the commencement of examination. Candidates are not allowed to go out of the examination hall/room during the first 30 minutes and last 10 minutes of the examination.
6. Write on both side of the leaf and use pens with same ink.
7. The medium of examination is English. Answer book written in language other than English is liable to be rejected.
8. All attached sheets such as graph papers, drawing sheets etc. should be properly folded to the size of the answer book and tagged with the answer book by the candidate at least 05 minutes before the end of examination.
9. The door of examination hall will be closed 10 minutes before the end of examination. Do not leave the examination hall until the invigilators instruct you to do so.
10. Always maintain the highest level of integrity. Remember you are a BITian.
11. Candidates need to **submit the question paper cum answer sheets before leaving the examination hall**.

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: B.Tech. **SEMESTER: 4**
BRANCH: PROD **SESSION: SP/22**

SUBJECT: PE 209 ENGINEERING ECONOMY, COSTING and ACCOUNTING

TIME: 2 HRS **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 2 sections – Section A: Multiple choice (30 marks); Section B: Short answer type (20 marks).
2. The missing data, if any, may be assumed suitably.
3. **Before attempting the question paper, be sure that you have got the correct question paper.**

SECTION A: Multiple choice questions 15×2=30 marks

Attempt ALL the questions

1. What amount must be paid in two years to settle a current debt of $1000/- if the interest rate is 6%?
(A) $1024 (B) $1124 (C) $1060 (D) $1160

2. In 3 years you are to receive $5,000. If the interest rate were to suddenly increase, the present value of that future amount to you would
(A) Fall (B) rise (C) remain unchanged (D) can't be determined without more information

3. Assume that the interest rate is greater than zero. Which of the following cash-inflow (Rs.) streams should you prefer?

	Year 1	Year 2	Year 3	Year 4
(A)	400	300	200	100
(B)	100	200	300	400
(C)	250	250	250	250

(D)Any of the above, since they each sum to 1000

4. Depreciation arises because of:
(A) Fall in the market value of an asset (B) Physical wear and tear (C) Fall in the value of money. (D) None of them.

5. Given a set of present value tables, an annual interest rate, the dollar amount of equal payments made, and the number of semi-annual payments, what other information is necessary to calculate the *present value* of the series of payments?
(A) the future value of annuity (B) timing of payment
(C) rate of inflation (D)no other information required

6. Consider the following two statements:
I. Whenever a firm's average variable cost decreases as output increases, its marginal cost is decreasing as well.
II. Whenever a firm's average total cost increases as output increases, its average variable cost is increasing as well.
(A) I is true and II is false (B) I is false and II is true.
(C) I and II are both true. (D) I and II are both false.

7. Which, if either, of the two machines X and Y should be selected?
(A) machine X because (EUAC)x < (EUAC)y (B) machine X because (EUAC)x > (EUAC)y
(C) machine Y because (EUAC)x < (EUAC)y (D) machine Y because (EUAC)x > (EUAC)y

8. A company produces a gear that is commonly used by several lawnmower manufacturing companies. The base cost of operation (rent, utilities, etc.) is $750,000 per year. The cost of manufacturing is $1.35 per gear. If these gears are sold at $7.35 each, how many must be sold each year to break even?

(A) 65,000 per year (B) 90,000 per year (C) 100,000 per year (D) 125,000 per year

9. Which of the following five situations are examples of making mutually exclusive decisions?

I. The maintenance department has requested a new air compressor and either a larger paint booth or an additional air compressor.
II. The machine shop needs new inspection and locating equipment.
III. The steno pool needs either a new, faster word processor or an additional office assistant.
IV. The budget committee must decide among building an employees' convenience store, an on-site cafeteria, an enclosed pool, or an in-house exercise room.
V. The newly elected union representative must resign due to a conflict of interest.

(A) I, II, and IV (B) I, II, and V (C) I, III, and IV (D) II, III, and V

10. Thick Trunk Sawmill purchases a new automated log planer for $95,000. The asset is depreciated using straight-line depreciation over a useful life of 10 years to a salvage value of $5,000. The book value at the end of year six is nearest to

(A) $9,000 (B) $38,000 (C) $41,000 (D) $54,000

11. Adventure Airlines recently purchased a new baggage crusher for $50,000. It is expected to last 14 years and has an estimated salvage value of $8,000. The depreciation charge on the crusher for the third year of its life and the book value at the end of 8 years (in $), using SOYD depreciation are

(A) 4800 and 16400 (B) 16800 and 8400 (C) 8400 and 16400 (D) 4800 and 16200

12. Classification of cost by changes in activity or volume refers to

(A) marginal cost (B) semi-variable cost (C) overhead cost (D) differential cost

13. Depletion refers to

(A) general loss in value of an asset due to aging process
(B) gradual loss of market value of an asset as it is being consumed or exhausted
(C) general loss in value of an asset due to excessive maintenance
(D) surpassing of an asset's technology by newer and/or different technologies

14. Decision criteria for replacement when defender marginal cost is increasing:

(A) When the Defender's marginal cost becomes greater than the Challenger's minimum EUAC, then replace the Defender with the Challenger.
(B) When the Defender's marginal cost becomes lesser than the Challenger's minimum EUAC, then replace the Defender with the Challenger.
(C) When the Challenger's marginal cost becomes greater than the Defender's minimum EUAC, then replace the Defender with the Challenger.
(D) When the Challenger's marginal cost becomes lesser than the Defender's minimum EUAC, then replace the Defender with the Challenger.

15. Contribution/sales (C/S) ratio refers to

(A) % margin of safety (B) sales revenue at break-even point
(C) profit/volume ratio (D) variable cost/profit ratio

SECTION B: Short answer type questions/numerical problems **5×4 = 20 marks**

Answer any four questions

1. Alpha industry is planning to expand its production operations. It has identified three different technologies for meeting the goal. Suggest the best technology which is to be implemented based on present worth (PW) method assuming MARR of 20% compounded annually.

	Initial outlay (Rs.)	Annual revenue (Rs.)	Life (years)
Technology 1	12,00,000	4,00,000	10
Technology 2	20,00,000	6,00,000	10
Technology 3	18,00,000	5,00,000	10

Given: value of compound interest factor (P/A, 20%, 10) = 4.1925

2. A material testing laboratory has two alternatives for purchasing a compression testing machine which will be used for determining compressive strength of different construction materials. The alternatives are from two different manufacturing companies.
Alternative I: Initial purchase price 10,00,000/-, annual operating cost 10,000/-, expected annual income to be generated from testing of different construction materials 1,75,000/-, expected salvage value 2,00,000/-, useful life 10 years.
Alternative II: Initial purchase price 7,00,000/-, annual operating cost 15,000/-, expected annual income to be generated from testing of different construction materials 1,65,000/-, expected salvage value 2,50,000/-, useful life 5 years.
Use present worth (PW) method and i=10% to select economical alternative.
Given values of compound interest factor:

(P/A,10%,10)	(P/F,10%,10)	(P/F/10%,5)
6.1446	0.3855	0.6209

3. The cost of an equipment is Rs. 62,000/- and its scrap value is Rs. 2000/-. The life of the equipment is 8 years. The maintenance costs for each year are as follows:

Year	1	2	3	4	5	6	7	8
Maintenance cost (Rs.)	1000	2000	3500	5000	8000	11000	16000	24000

When the equipment should be replaced?

4. A company has purchased an equipment whose first cost is Rs. 1,00,000/- with an estimated life of 8 years. The estimated salvage value of the equipment at the end of its lifetime is Rs. 20,000/-. Determine the depreciation charge and book value at the end of various years using straight line (SL) method. Compute the depreciation and the book value for period 5.

5. A machine shop has 10 lathes, 6 drill presses and 2 milling machines. Calculate the machine hour rate for milling machines if the factory expenses for a particular period and other data are as follows:

- Areas occupied by lathe, drill, milling machines are 10 m^2, 3 m^2, 2 m^2 respectively.
- Cost of indirect material and labour 1,20,000/-
- Rent of building 36000/-, insurance 15000/-
- Depreciation : 20000/- (lathe), 15000/- (drill), 20000/- (milling machine)
- Power consumed : 18000/-(lathe), 6000/- (drill), 900/- (milling machine)
- Repair and maintenance: 10000 (lathe), 4000/- (drill), 4000/- (milling machine)
- Machine hours: 10000 for lathe, 6000 for drill, 2000 for milling machine.

Consider indirect expenses are related to floor space occupied by the machines.

6. The fixed cost for the year 2018-2021 is Rs. 5,00,000/-. Variable cost per unit is Rs. 25/-. The estimated sales for the period valued Rs. 15,00,000/-. Each unit sold at Rs. 150/- (i) Determine break-even point (BEP) (ii) if Rs. 12,00,000/- is the likely turnover for the next budget period, calculate estimated contribution and profit. (iii) if a profit target of Rs. 6,50,000/- has been budgeted, compute the turnover required.

7. Prepare the trial balance from the following account particulars of ABC Co. as on 31st March 2022.

Name of A/Cs	Rs.	Name of A/Cs	Rs.
Opening stock	40,000	Furniture	6,000
Purchases	85,000	Machinery	62,000
Purchase returns	5,000	Debtors	36,000
Sales	1,80,000	Creditors	12,750
Sales returns	6,200	Bills receivable	4,600
Rent	1.200	Bills payable	2,500
Salaries	5,700	Cash in hand	5,220,
Advertisement	880	Bank overdraft	10,000
Commission received	1,440	Interest on overdraft	1,800
Discount Cr.	710	Capital	50,000
		Drawings	7,800

:::::29/04/2022:::::