

**FACULTY OF ENGINEERING****BE 4/4(CIVIL) I-Semester (Backlog) Examination, December 2019****Subject : Concrete Technology****Time: 3 Hours****Max. Marks: 75****Note:** Answer all Questions from part -A & Any Five Questions from part-B**PART-A (25 MARKS)**

- |    |   |   |
|----|---|---|
| 1  | Write the operations for machine mixing of concrete in sequence.  | 3 |
| 2  | What is maturity of concrete and gel space ratio  | 3 |
| 3  | What is the relationship between mean strength and characteristic compressive strength. What is the significance of 1.65 in the relationship. | 3 |
| 4  | Write at least three applications of High Density concrete  | 3 |
| 5  | How durability of concrete can be improved.   | 3 |
| 6  | What is meant by standard deviation.  | 2 |
| 7  | Write the advantages of Ready mixed concrete.   | 2 |
| 8  | What is the concept of Recycled aggregate concrete  | 2 |
| 9  | What is aspect ratio and how it is calculated.  | 2 |
| 10 | Write any four uses of Ferrocement.   | 2 |

**PART-B (50 MARKS)**

- |        |  |    |
|--------|--|----|
| 11 a)  | What are the factors which affect workability of concrete and write the corrective measures.                         | 5  |
| b)     | Write about the short term and long term properties of concrete  | 5  |
| 12 a)  | What is the purpose of steam curing of concrete and explain its process.   | 5  |
| b)     | Explain what is meant by batching of materials? Write about the methods of batching.                                 | 5  |
| 13 a)  | Write in detail the IS Method of concrete mix design with examples.  | 6  |
| b)     | Differentiate between nominal mix and design mix.  | 4  |
| 14 a)  | Give classification of admixtures and name examples for each type of admixture.                                      | 5  |
| b)     | What is Fly ash? Write its properties and applications.  | 5  |
| 15     | What are the various types of special concretes available? Write their characteristics, advantages and applications. | 10 |
| 16. a) | Discuss with examples the advantages and applications of fibre reinforced concrete                                   | 5  |
| b)     | What is self compacting concrete? Explain the workability test for self compacting concrete                          | 5  |

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**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I Semester (Old) Examination, December 2019****Subject: Mobile Cellular Communications****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 Grade of services and trunking in mobile cellular system.
2. Why handoff's are to be prioritize over new cells.
3. Differentiate the propagation effects with mobile radio.
4. Calculate the Brewster angle,  $\theta_B$  for a wave impinging on poor ground having a permittivity of  $\epsilon_r = 4$  at the frequency of 100MHz.
5. Explain SDMA.
6. In US AMPS, 416 channels are allocated to various cellular operators. The channel between them is 30KHz with the guard band of 10KHz. Calculate the spectrum allocation given to each operator.
7. What is self Jamming in CDMA
8. What is Digital Cellular standard (IS-95)? Explain.
9. Compare features of 3G and 4G.
10. Write about WLAN.

**PART – B ( 50 Marks)**

- |         |   |        |
|---------|---|--------|
| 11.(a)  | What is the need for Frequency Reuse? Prove that for a hexagonal geometry the Co-Channel Reuse Ratio is $3N$ where $N = i^2 + j^2 + ij$     | 7      |
| (b)     | Explain the operation of basic cellular mobile system with neat block diagram Briefly discuss Durkin's model for outdoor propagation model. | 3<br>5 |
| 12. (a) |   |        |
| (b)     | What is Small Scale Fading? List out the factors influences Small Scale Fading?   | 5      |
| 13. (a) | Discuss the Cell Capacity of TDMA.  | 6      |
| (b)     | Explain briefly about Frequency Hopped Multiple Access (FHMA).  | 4      |
| 14. (a) | Explain CDMA reverse channel modulation process for a single user with a neat block diagram.  | 5      |
| (b)     | Discuss the services offered by GSM.  | 5      |
| 15. (a) | Explain Personal Assistance Network (PAN) as provided by Bluetooth.   | 4      |
| (b)     | Explain the architecture of UMTS system   | 6      |
| 16.     | Explain various GSM channel types, their functions and call handling in GSM.  | 10     |
| 17.     | Write short note on:<br>(a) Carrier Sense Multiple Access (CSMA)<br>(b) Reservation Protocols.  | 5+5    |

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**FACULTY OF ENGINEERING****B. E. 4/4 (M/P/AE) I – Semester (Backlog) Examination, December 2019****Subject: Operations Research****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part – A, & any Five questions from Part – B****PART – A (25 Marks)**

- 1 Define Operations research.
- 2 Discuss the role of slack variables in simplex method.
- 3 What is the principle of duality in linear programming? Explain its advantages.
- 4 State the condition of simplex to be solved by dual simplex.
- 5 How is Hungarian method applied for obtaining a solution if matrix is rectangular.
- 6 Explain how to resolve degeneracy in a transportation problem.
- 7 State major limitations of game theory.
- 8 Why replacement of equipment is necessary.
- 9 Define queue discipline.
- 10 Explain principal assumptions made while dealing with sequencing problem.

**PART – B (5 x 10 = 50 Marks)**

11 Max  $Z = X_1 - 3X_2 + 2X_3$

STC  $3X_1 - X_2 + 2X_3 \leq 7$

$2X_1 + 4X_2 \leq 12$

$-4X_1 + 3X_2 + 8X_3 \leq 10$

$X_1, X_2, X_3 \geq 0$

12 Use dual simplex method to solve following LPP

Max  $Z = -2X_1 - 2X_2 - 4X_3$

STC  $2X_1 + 3X_2 + 5X_3 \leq 2$

$3X_1 + X_2 + 7X_3 \leq 3$

$X_1 + 4X_2 + 6X_3 \leq 5$

$X_1, X_2, X_3 \geq 0$

13 Determine minimum transportation cost.

Customer

	1	2	1	4	5	2	30
	3	3	2	1	4	3	50
Warehouse	4	2	5	9	6	2	75
	3	1	7	3	4	6	20
	20	40	30	10	50	25	

14 Determine optimum assignment schedule.

160	130	115	190	200
135	120	130	160	175
140	110	125	170	185
50	50	80	80	110
55	35	80	80	105

15 The maintenance cost per year of a truck whose purchase price is Rs 8000 are given below. Determine at which time it is profitable to replace the truck.

Year	1	2	3	4	5	6	7	8
Maintenance cost	100 0	130 0	170 0	200 0	290 0	380 0	480 0	600 0
Resale price	400 0	200 0	120 0	600	500	400	400	400

16 Determine a sequence for the jobs that will minimize the elapsed time.

Job	1	2	3	4	5	6
Machine A	8	3	7	2	5	1
Machine B	3	4	5	2	1	6
Machine C	8	7	6	9	10	9

17 Write short notes on

a) NSGA technique

b) Two person Zero Sum game giving a suitable example.

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## FACULTY OF ENGINEERING

**B.E. 4/4 (CSE) I-Semester (Backlog) Examination, December 2019**

**Subject : Principles and Applications of Embedded Systems**

**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  | List any three difference of Harvard & John von Neuman architecture?                                    | 2 |
| 2  | What is Load-Store architecture? What is the reason behind why ARM processor follows this architecture? | 3 |
| 3  | Illustrate the steps in Bus organization for 4-Cycle Handshake protocol?                                | 2 |
| 4  | Write the Importance of Co-Processor in Embedded system? Justify with a suitable example?               | 3 |
| 5  | What is priority Inversion? Write the uses of it?   | 2 |
| 6  | What is Re-entrant function? What is the role of Re -entrant function?                                  | 3 |
| 7  | What are the parameters of CPU usage metric?  | 2 |
| 8  | What are the characteristics & users of multiprocessor system?  | 2 |
| 9  | Why do we use Cross-Compiler? Justify with an example?  | 3 |
| 10 | Illustrate the steps of loading embedded software into the target system?                               | 3 |

### PART – B (50 Marks)

- |       |  |    |
|-------|--|----|
| 11 a) | Elaborate the various phases of Embedded system design process with an Example of Traffic Controller?  | 6  |
|       | b) What are the challenges of embedded computing system Design?  | 4  |
| 12    | Explain the merits of Interrupt driven I/O programming over busy-wait-I/O with appropriate examples?   | 10 |
| 13 a) | Explain the process of achieving concurrency during DMA process with a suitable example?               | 6  |
|       | b) What are tasks and tasks states. Give examples.   | 4  |
| 14 a) | Describe RMS & EDF Priority Based Task Scheduling Algorithms?  | 6  |
|       | b) Explain the format of CAN Bus for distributed Embedded system?                                      | 4  |
| 15 a) | Explain the techniques used for testing Embedded system?   | 6  |
|       | b) Explain the purpose of using Laboratory tools for testing & debugging embedded software?            | 4  |
| 16 a) | Elaborate the techniques used for loading the embedded software into a target machine with an example? | 6  |
|       | b) What are the effects of scheduling on cache with a suitable example?                                | 4  |
| 17    | Write any <b>Two (2)</b> of the following :  | 10 |
|       | a) Explain Hard Real time scheduling?  |    |
|       | b) What is the method used in process of Bus read & Write by DMA.                                      |    |
|       | c) Short notes of First and second cache levels.   |    |

**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I-Semester (Backlog) Examination, December 2019****Subject: Embedded Systems (Elective II)****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. Write the salient features of embedded processors. [2]
2. What are the factors for selecting a processor during the system design phase? [2]
3. What is the nomenclature of ARM{x}{y}{z}TDMI core? [3]
4. List various Interrupts in ARM core. [2]
5. Write any three important advantages of PCI/PCI-X compared with Industry Standard Architecture (ISA). [3]
6. What is AMBA bus? Mention any two important characteristics of it in ARM. [3]
7. Why is a host system used for most stages of development, test and simulation? [2]
8. Mention the software development tools used for design of an embedded system. [3]
9. Give examples of hardware dependent and hardware independent codes. [3]
10. Give two advantages of Instruction set simulators. [2]

**PART – B (50 Marks)**

11. a) Describe the challenges in embedded system design. [5]  
b) Briefly explain classifications of embedded systems. [5]
12. a) Draw and explain CPSR register of ARM processor. [5]  
b) What is a RISC processor? How does the ARM thumb instruction overcome the code density problem? [5]
13. a) What is I2C protocol? Explain use of each control bit of I2C bus. [5]  
b) Describe the various Internet enabled system network protocols. [5]
14. a) Draw the diagram of a native tool chain. Mention the requirement of cross-assembler and cross-compiler in native tool chain when applied to embedded system. [5]  
b) What is a target system? How does the target system differ from the final embedded system? [5]
15. a) What is an in-circuit emulator? Describe clearly with an example. [5]  
b) Explain the different modes of operation of a logic analyzer. [5]
16. a) What are the various hardware and software debugging techniques being adopted for testing the embedded system design? [5]  
b) Draw the various level of design process in embedded system. [5]
17. Write short note on any two of the following: [10]
  - a) Modes of operation in ARM.
  - b) IEEE 1394 bus standard.
  - c) RTOS Characteristics.

**FACULTY OF ENGINEERING**  
**B.E. 4/4 (ECE) I-Semester (Backlog) Examination, December 2019**

**Subject: Entrepreneurship (Elective-II)**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer all questions from Part-A & any five questions from Part-B**

**PART – A (25 Marks)**

1. What is difference between business culture and culture of society? 2M
2. Explain how small industries foster big industry? 3M
3. What are sources for funding SSI units in India? 2M
4. What are characteristics of entrepreneur? 3M
5. State the sequential stage of project formulation. 3M
6. What are the elements of a project? 2M
7. What is need for network techniques in project design? 3M
8. What is activity in project? 2M
9. State the time Management matrix. 3M
10. What is attitude of entrepreneur? 2M

**PART – B (5 x 10 = 50 Marks)**

11. a) What are the barriers to entrepreneurship in India? 5M  
b) Explain how does entrepreneurship help economic growth? 5M
12. a) Explain how business idea evaluation is processed in different stages? 5M  
b) Describe the contents of Project report. 5M
13. a) Explain the project management processes. 5M  
b) Explain the content of project feasibility analysis for technical analysis. 5M
14. Explain the importance of network analysis in Project Design. The following table shows normal time, normal costs and crash costs. 10M

Activity	Normal		Crash	
	Time(days)	Cost(Rs.)	Time(days)	Cost(Rs.)
1-2	6	60	4	100
1-3	4	60	2	200
2-4	5	50	3	150
2-5	3	45	1	65
3-4	6	90	4	200
4-6	8	80	4	300
5-6	4	40	2	100
6-7	3	45	2	80

15. a) Explain the weakness of urgency addiction factor in business decisions. 5M  
b) Discuss any five different attitudes of entrepreneurship. 5M
16. a) Discuss the motivation aspect of entrepreneur. 5M  
b) Explain the areas of entrepreneurship in the E-commerce for engineering. 5M
17. a) State the sequential stages of project formulation. 5M  
b) Explain the following terms in project formulation-Techno-economic analysis. 5M

**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I-Semester (Backlog) Examination, December 2019****Subject : Internet of Things (Elective-II)****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 Internet of Things (IoT) with example. 2
2. What is Machine to Machine communication (M2M)? 2
3. What are the different Ports with respect to TCP and UDP? 2
4. What is the difference between static and dynamic IP addressing? 2
5. Write a short note on Sensors. 2
6. Give three features of Arduino Uno? 3
7. What are the data types in Python? 3
8. Give some examples of libraries used in Python programming? 3
9. What are the different Amazon Webservices? 3
10. Explain on Devices Security and Privacy of IoT cloud with respect to data analytics. 3

**PART- B (50 Marks)**

11. a) Explain the Design principle for connected devices in IOT. 5  
b) What is smart transportation and Moility? 5
- 12 a) Explain various IoT protocol used at different layers 5  
b) Explain the differences between TCP and UDP 5
- 13 a) Explain the need for low power communication devices in IOT 5  
b) What are the differences between Raspberry pi and Beagle bone Black 5
- 14 a) What is the importance of API? Explain the criteria for writing a new API 5  
b) Write a simple program in python for traffic light signals. 5
- 15 a) What is role of Cloud Computing and Big Data in Internet of Things? 5  
b) What is smart irrigation? Explain its advantages. 5
- 16 a) Compare TCP/IP layer and OSI layer model. 5  
b) Explain IoT Applications and Deployment Scenarios in different domains. 5
- 17 Write a note on :  
a) HTTP and HTTPS 3  
b) Trust for IoT, Security and Privacy for IoT 4  
c) CNC milling 3

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**FACULTY OF ENGINEERING****B. E. 4/4 (I.T.) I – Semester (Backlog) Examination, December 2019****Subject: Wireless & Mobile Communications (Elective-II)****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A & any five questions from Part – B.****PART – A (25 Marks)**

1. Define Path loss and Far-field distance. [3]
2. Explain the concept of frequency reuse. [2]
3. State the three basic propagation mechanisms. [3]
4. Differentiate 2G and 3G wireless networks. [2]
5. What are the advantages of Digital Modulation? [2]
6. Distinguish Linear and Constant envelope modulation. [3]
7. Compare FDMA and TDMA. [3]
8. Sketch GSM system architecture. [2]
9. What is the difference between Traditional TCP and Mobile TCP? [3]
10. List the goals of Mobile IP. [2]

**PART – B(50 Marks)**

11. a) Explain various Hand-off strategies. [7]  
b) Differentiate adjacent channel interference & Co-channel interference. [3]
12. Explain Indoor and Outdoor propagation models. [10]
13. a) What is meant by Direct sequence spread spectrum modulation? Explain DSSS transmitter and receiver with the help of block diagrams. [7]  
b) What are the advantages of spread spectrum modulation? [3]
14. a) Discuss about GPRS. [5]  
b) Differentiate Wireless & Fixed telephone networks. [5]
15. Explain Dynamic host configuration protocol in detail. [10]
16. a) Discuss about Agent advertisement & discovery. [6]  
b) Briefly explain about Transaction oriented TCP. [4]
17. Write notes on  
a) Trunking and Grade of Service [5]  
b) Space division multiple access [5]

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**FACULTY OF ENGINEERING****B.E VII Semester (CBCS) (Civil) (CBCS) Examination, December 2019****Subject: Foundation Engineering****Time: 3 Hours****Max. Marks: 70****Note: Answer all questions from Part A & any five questions from Part B****PART –A (10 x 2 = 20 Marks)**

- 1 Draw the typical contact pressure distribution of a flexible footing on cohesive and cohesionless soil.
- 2 Define ultimate and safe bearing capacity.
- 3 What are isobars or pressure bulbs? Explain with neat sketch.
- 4 Write the static and Dynamic formulae for pile capacity?
- 5 Describe Box caissons and state when they are preferred?
- 6 What are the different types of machine foundations?
- 7 List the field tests commonly used in soil investigations.
- 8 Sketch a typical timber braced cut and name the parts.
- 9 What is under pinning? List out various methods
- 10 State the purpose of Dewatering.

**PART – B (5 x 10 = 50 Marks)**

- 11 a) Compare the Boussinesq theory with Westergaards theory and comment on suitability of these theories.  
b) A column of a building transfers a concentrated load of 15KN to the soil in contact with the footing .estimate the vertical pressure at the footing points by making use of Boussinesq and Westergaards equation vertically below the column load at a depth of 4m and at a radial distance of 2m,4m, and 6m.
12. a) Differentiate between general shear failure and local shear failure.  
b) A column carries a load of 500KN. The soil is dry sand weighing  $18\text{KN/m}^3$  and having an angle of internal friction as  $35^\circ$  ,A minimum factor of safety of 2.5 is required. Use Terzaghis bearing capacity factors  $N = 42$ ,  $N_q = 21$ . Also find size of footing if it is placed at ground surface.
13. a) Explain pile load test in detail.  
b) A timber pile was driven by a drop hammer weighing 40KN with a free fall of 1.5m. The average penetration of last few blows was 5mm .What is the capacity of the pile according to Engineering News formula?
14. a) Write in detail about Cofferdams  
b) Describe Tilt and Shift in installation of caissons .explain different methods for rectification of tilt and shift with the help of neat sketches.
15. a) Critically compare Pneumatic Caissons with an Open Caissons  
b) What are the different methods of Timbering of trenches and explain any one in detail.
16. a) Write a detailed note on trial pit method of geotechnical investigations.  
b) Explain various dewatering methods.
17. Write a note on any two of the following:
  - a) Proportion of footings
  - b) Pile raft foundation
  - c) Applications of Geosynthetics
  - d) Necessity of Underpinning

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**FACULTY OF ENGINEERING****B.E VII Semester (CBCS) (ECE) (Main) Examination, Dec 2019****Subject: Human Values and Professional Ethics****Time:3hrs****Max. Marks :70****Note: Answer all questions from Part-A and any Five questions from Part-B****PART-A (2x10=20 Marks)**

1. List out four Basic Guidelines for Value Education.
2. Are production skills and human values complementary? Give reasons.
3. What is the difference between 'belief' and 'understanding'?
4. What is the purpose of Self-exploration?
5. Differentiate Realization and Understanding.
6. Explain Happiness and Prosperity.
7. Explain Trust and Respect as the foundational values of relationships.
8. What is Basic Human Aspiration?
9. Relate *Sanyama* and *Svasthya*.
10. What is Continuous Happiness?

**PART-B (50 Marks)**

- |  |   |
|--|---|
| 11.a. Bring out the differences between Units and Space.   | 5 |
| b. Explain the process of value education.   | 5 |
| 12.a. Can Self-regulation lead to Prosperity? Explain with examples.   | 5 |
| b. What is the content of self-exploration? Elaborate.   | 5 |
| 13.a. What do you mean by natural acceptance? Illustrate with examples.  | 5 |
| b. Elaborate the point: 'Existence = Nature submerged in Space'.   | 5 |
| 14. a. What are the implications of holistic understanding of Harmony on Professional Ethics?  | 5 |
| b. Explain the terms 'Recyclability' and 'Self – regulation' in Nature?  | 5 |
| 15. a. How do we achieve Harmony in Nature?  | 5 |
| b. What is Humanistic Constitution?  | 5 |
| 16. a. Discuss the various problems faced due to Differentiation.  | 5 |
| b. Define the most important human values– Reverence / <i>Shraddha</i> , Glory / <i>Gaurava</i> , Gratitude / <i>Kritagyata</i> Love/ <i>Prema</i> . | 5 |
| 17.a. What are the four Orders of Nature?  | 5 |
| b. There is interconnectedness and mutual fulfilment in the four Orders of Nature. Explain   | 5 |

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**FACULTY OF ENGINEERING****BE VII- Semester (CBCS)(M/P/AE)(Main) Examination, December 2019****Subject: Managerial Economics and Accountancy****Time: 3 Hours****Max Marks: 70****Note: Answer all Questions from Part-A, & any Five Questions from Part-B****PART – A (10 x 2 = 20 Marks)**

- 1 Distinguish between economics and managerial economics.
- 2 What are Giffen's goods?
- 3 What is short run and long run demand?
- 4 Explain Evolution of economics.
- 5 What are the features of perfect competition?
- 6 What is explicit and implicit cost?
- 7 What are the components of working capital?
- 8 What is Accounting rate of return?
- 9 What is convention of conservatism?
- 10 Journalize the following transactions.
  - a) Received cash from Krishna Rs.15000.
  - b) Sold goods to Gupta Rs.5000.

**PART – B (50 Marks)**

- 11 Discuss in detail the basic concepts of managerial economics.
- 12 Define elasticity of demand and discuss various kinds of elasticity of demand.
- 13 Define Cobb –Douglas production function .Describe the law of variable proportions.
- 14 From the following data, you are required to calculate,
  - a) P/V ratio
  - b) Break-even point.
  - c) Profit or loss when the sales amount of Rs.100000.
  - d) Sales required to earn a profit a profit of Rs. 50000.

I Year	Sales Rs.175000	Profit Rs.30000
II Year	Sales Rs. 200000	Profit Rs.45000

- 15 A project cost Rs. 100000 and has a scrap value of Rs.10000.The profit before depreciation and tax throughout five years is Rs. 20000, Rs. 25000, Rs. 30000, Rs.35000 and Rs. 40000. Assuming a 35% tax and depreciation on straight line basis calculate the average rate of return.
- 16 Prepare a Pettycash book from the following particulars.
 

2006, Jun 1 – Opening balance Rs. 1600	Jun 7- Tea expenses Rs.90.
Jun 2 – Transport Rs. 150.	Jun 9 -Transport Rs.150.
Jun 2- Postage Rs. 220.	Jun 11- Stationery Rs.75.
Jun 3- Taxi charges Rs. 50.	Jun 14- Wages of the peon Rs.100
Jun 4- Wages to peon Rs.150.	Jun15 - Postage Rs.100.
Jun 6- Stationery Rs. 75.	

17 Prepare final accounts from the following Trial balance of Mr. Krishna for the year ended 31-3-2008.

**Trial Balance as on 31-3-2008**

<b>Debit balances</b>	<b>Amount (Rs.)</b>	<b>Credit Balances</b>	<b>Amount(Rs.)</b>
Purchases	25200	Sales	61604
Furniture	1600	Capital	35000
Wages	3500	Creditors	3903
Machinery	20000	Purchase returns	222
Opening stock	17525		
Sales returns	1200		
Debtors	10400		
Carriage inwards	200		
Salaries	10600		
Carriage outwards	503		
Rent & Taxes	2001		
Cash at bank	8000		
<b>Totals</b>	<b>100729</b>		<b>100729</b>

**Adjustments:**

1. Closing stock Rs.16800.
2. Outstanding salaries Rs.400; prepaid rent Rs. 201.
3. Provide 5% to bad debts on debtors.
4. Depreciation on Machinery at 10%.
5. Interest on capital at 5%.

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