SCHEME OF EVALUATION				
(Scoring indicators) SET B				
REVISION	**2021**		**COURSE CODE**	**5001 B**
COURSE TITLE	**INDUSTRIAL MANAGEMENT AND SAFETY**			
QUESTION NO.	SCORING INDICATORS	SPLIT UP SCORE	SUB TOTAL	TOTAL
	Part A			
1	Management is the art of knowing what you want to do and then seeing that it is done in the best and cheapest way.	1	1	9×1 =9
2	Indian Coffee House, Indian Farmers Fertiliser Cooperative etc.	Any one	1	
3	Stock of physical asset which has economic value	1	1	
4	Predecessor Event	1	1	
5	Critical Path Method	1	1	
6	i. Improper lighting and ventilation, ii. Radiation exposure	2x0.5	1	
7	A sole proprietorship is a business that has a single owner who is responsible for making decisions for the company.	1	1	
8	Critical Path	1	1	
9	Vision can be described as desired future position of company.	1	1	
	Part B			
II 1	**<u>Type of wages</u>** **1. Nominal wages** **2. Real Wage** **3. Minimum Wage** **4. Living Wage** **5. Fair Wage** 1.**<u>Nominal wages</u>**: Nominal wages are the wages received by a worker in the form of money. 2.**<u>Real Wage:</u>** Real wage includes the amount needed to necessities, comforts, luxuries and cash payments which a worker can get in return of his effort and work. 3.**<u>Minimum Wage:</u>** A minimum wage is a compensation to be paid by an employer to his workers irrespective of his ability to pay.	List out 1+ Explain any two 2x1	3	3

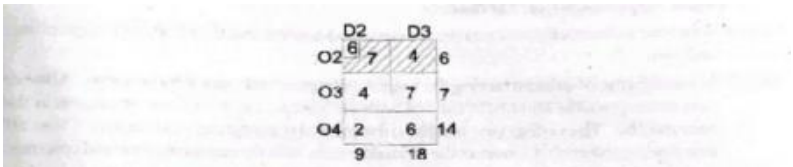
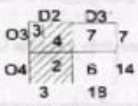
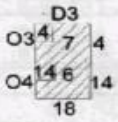
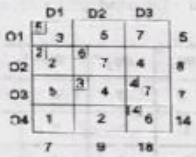
2	**Methods of Training** **1. On the job training** **2. Off the job training** 1.**<u>On the job training-</u>** On the job training methods are those which are given to the employees within the everyday working of a concern. The employees are trained in actual working scenario. 2. **<u>Off the job training-</u>** Off the job training methods are those in which training is provided away from the actual working condition. Instances of off the job training methods are workshops, seminars, conferences, etc.	List out 1+ Explain 2x1	3	3
3	The steps for the installation of ISO 9000 are 1)Preparatory Step 2)Implementation Step 3)Registering and Certificate Step	3x1	3	3
4	1. Provide the needed materials, supplies, services, and equipment requested on a timely basis and with a minimum investment. 2. Procurement of requested materials and services from vendors. 3.Assist departments when emergency purchases are necessary.	3 Points 3x1	3	3
5	**<u>CPM application</u>** 1. Construction of civil and mechanical projects 2. Electrical and electronic product manufacturing and assembling 3. Equipment maintenance 4. Setting up new industry	Any Three 3x1	3	3
6	**<u>Private Limited Company:</u>**Its is an association of persons formed voluntarily having the minimum paid up capital of Rs.100,000. The capital is collected from the private partners with maximum 50 members. Example: Factory	2x1.5	3	3

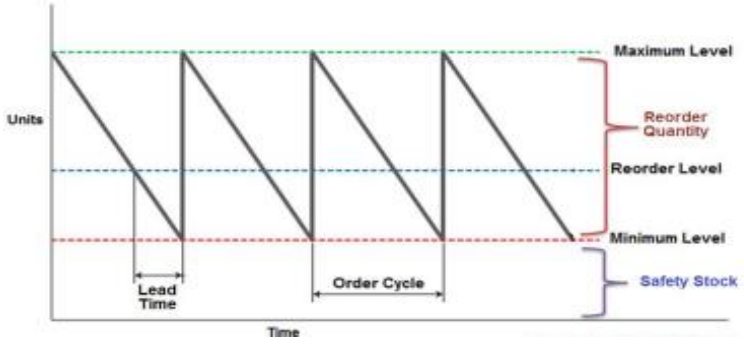
	<u>Public Ltd company:</u> It's is an association of persons formed voluntarily having the minimum paid up capital of Rs.500,000. There is no defined limit on the number of members the company can have. Example: Engineering firm: BHEL			
7	1. **<u>Optimistic time, t_o (a minimum time)</u>** – In this, it is assumed that everything will go well.In this no provisions are made for delays or breakdowns. 2. **Most likely time, t_m (an average time)** – In this it is assumed that things go in normal way with a few delays or setbacks. This estimate of time lies between the optimistic and pessimistic time. 3. **Pessimistic time , t_p (a maximum time)** – This time is based on the assumption that everything will go badly. Thus it is the maximum possible time taken for the completion of an activity.	3x1	3	3
8	1. All electrical supply lines and apparatus shall be of sufficient mechanical strength. 2. Every electrical appliance should have name plate showing the rated voltage, power, amperage etc. 3. Only the authorised and licensed electrician should do the electrical works.	Any 3 points 3x1	3	3
9	**<u>Critical path:</u>** The path in which a LFT and EFT are equal is called critical path. It can be represented by double line. **<u>Dummy activity:</u>** A dummy activity which is not utilizing time or resource. It is an imaginary activity represented by dotted arrow line.	2x1.5	3	3
10	Accident may cause due to **1. Mechanical factors** **2. Environmental factors** **3. Personal factors** **<u>1. Mechanical factors :</u>** i. Improper machine guarding ii. Unsafe construction	List out 1+ Explain any two 2x1	3	3

	2. Environmental factors i. High temperature ii. High humidity **iii. Personal factors** i. Age ii. Financial situation			
	Part C			
III	The various contributions of Taylor were as follows 1.He developed the principle of breaking a task (job) into elements for timing the same. 2.He kept himself involved in exploring the causes of inefficiency and labor difficulties in the industry. 3.He evolved certain principles of investigating work on scientific basis which lead to the concept of Scientific Management. 4.Another concept connected with the name of Taylor is A Fairy Day's Task. 5.Taylor developed functional organization in which one foreman was made in charge for each function. 6.Taylor devoted his maximum attention towards time studies and he established work standards. 7.Taylor introduced and operated various costing systems. 8.Taylor suggested a wage incentive scheme known as Taylor's Differential Piece Rate plan.	Any Seven points 7x1	7	7
	or			
IV	1.Division of work 2.Authority and responsibility 3.Discipline 4.Unity of command 5. Unity of direction 6.Subordination of individual interest to general interest 7.Remuneration 8.Centralization 9.Scalar chain 10. Order	14x0.5	7	7

	11.Equity 12. Stability of tenure of personnel 13. Initiation 14. Espirit Decorps			
V	**5 S CONCEPT** The 5S quality tool is derived from five Japanese terms beginning with the letter "S" used to create a workplace suited for visual control and lean production. The pillars of 5S are simple to learn and important to implement **Seiri:** To separate needed tools, parts, and instructions from unneeded materials and to remove the unneeded ones. **Seiton:** To neatly arrange and identify parts and tools for ease of use. **Seiso:** To conduct a cleanup campaign. **Seiketsu:** To conduct seiri, seiton, and seiso daily to maintain a workplace in perfect condition. **Shitsuke:** To form the habit of always following the first four S's.	Concept 2+ 5S Explain (5x1)	7	7
	or			
VI	**Ten "manthras'' of TQM** 1. Quality is through continuous involvement and effort. 2. Quality involves hard work and devotion 3. Quality is everybody's business 4. Quality begins cleanliness 5. Take quality and quality will take care everything 6. Make it right for first time 7. Quality is achieved through team work. 8. Document is dependable. 9. Quality is end and begins with education 10. Quality used to evaluate product and services	(10x0.7)	7	7
VII	Linear Programming is a mathematical tool/technique for determining the best uses of an organization's resources or Linear programming deals with the optimization (maximization or minimization) of a function of variables known as objective function subject to a set of linear equalities and/or inequalities known as constraints.	Define 1+ Steps 6x1	7	7

	Steps to Solve LPP 1.Formulate the linear programming problems 2.Plot the given constraint lines considering them as equations. 3.From the above graph identify the feasible solution region. 4.Locate the corner points of the feasible solution region. 5.Calculate the value of the objective function on the corner points. 6.Now choose the point where the objective function has optimal value.			
	or			
VIII	**Problem 7.11** A company has 4 manufacturing units and which has to be distributed to 3 different wholesale distributors. The table a shows the supply capacities of the manufacturing units and the demands of the whole sailers at three destinations. The cost of transporting one unit of the product from each of the manufacturing unit to each of the wholesaler is given in table a. Whole saler Factory | D1 D2 D3 | Supply O1 3 5 7 5 O2 2 7 4 8 O3 5 4 7 7 O4 1 2 6 14 Demand 7 9 18 **Table a** **Solution** Allocate to cell (1,1) minimum of 5 & 7 i.e; 5. Thus O_1 row is totally exhausted. Since the supply of O_1 is completely met. So cross off the raw O as shown in table b. D1 D2 D3 O1 5 3 5 7 5 O2 2 7 4 8 O3 5 4 7 7 O4 1 2 6 14 7 9 18 **Table b** Consider the reduced matrix after deleting O_1 row .Now allocate to the cell (1,1) minimum of 8&2 i.e; 2.. Thus Column D_1 is exhausted and it is crossed off as shown in table c. D1 D2 D3 O2 2 2 7 4 8 O3 5 4 7 7 O4 1 2 6 14 2 9 18 **Table c** Consider the reduced Matrix and allocate to the cell (1,1) min of 6& 9 i.e; 6.Thus the raw O_2 is crossed off as shown in table d.	Steps 5+ Result 2	7	7

	 **Table d** Allocate to cell (1,1) min of 7 & 3 i.e; 3.Thus D_2 Column is crossed off as shown in table e.  **Table e** Finally allocate 4 to cell (1,1) and 14 to cell (2,1) as shown in table f.  **Table f** The various allocations made to the cells are shown in table g and the initial feasible solution is as shown in this table.  **Table g** Total transportation cost $= 5 \times 3 + 2 \times 2 + 6 \times 7 + 3 \times 4 + 4 \times 7 + 14 \times 6 =$ **Rs 185** Ans			
IX	**i)Performance index:** Performance index is the square root of the product of frequency and severity rate divided by 1000 and it's also known as frequency severity index. Performance index= [(Frequency rate x Severity rate)/1000] **ii)Frequency rate:** Frequency rate is the number of occupational accidents with leave for 1000000 worked hours. Frequency rate = [(number of accidents with sick leave x 10^6) /number of worked hours] **iii)Severity rate:** The rate of severity represents the number of days compensated for 1 000 worked hours, that is the number of days lost by temporary disability for 1000 worked hours. Severity rate = [(number of days compensated x 1000)/ number of worked hours] **iv)Accident proneness:** The small proportions of the workers in the industry receive a large proportion of injuries and workers in these groups are said to be accident prone	i) 2 marks ii)2 marks iii)2 marks iv)1 mark	7	7

	or			
X	The 4 E's of accident prevention technique are **1. Engineering** **2. Education** **3. Enforcement** **4.Emergency Care** 1. **<u>Engineering Methods:</u>** This involves using of proper machine tools, proper transport use protective devices, alarm system, evacuation plan in case of fire etc. 2. **<u>Education:</u>** Educate employees to practices to be followed to ensure safety. It can be done through induction, training, using proper supervisor, forming safety committees etc. 3. **<u>Enforcement:</u>** It's forcing everyone to follow the rules. Everyone should be contributed to ensure safety. 4.**<u>Emergency Care</u>**: Nearly 50% of people in India die on the spot or while transiting to the hospital. If the occurrence of accidents and location can be shared to provide emergency care with in golden hours a lot of lives can be saved.	List out 1+ Explain 6 (4x1.5)	7	7
XI	Types of Inventory model are 1.EOQ Model 2.ABC Model **<u>1.EOQ Model</u>**  The important terms in EOQ is explained below, **<u>i)Max stock:</u>** Max limit of stock at a time. **<u>ii)Minimum stock:</u>** It is the minimum level of stock should	List out 1+ Explain any one model 3+Graph 3	7	7

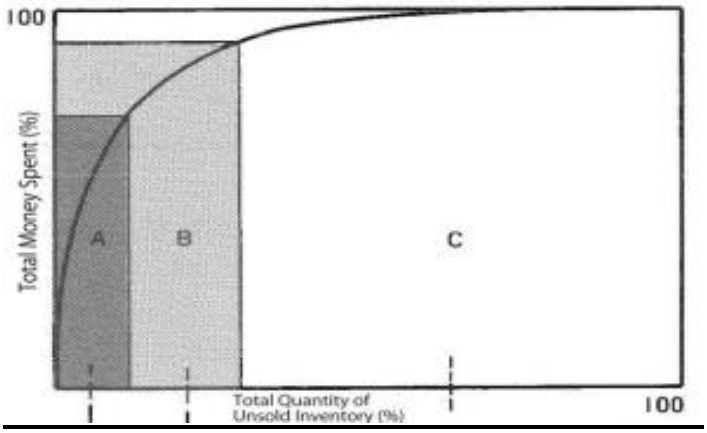
kept always in store.

iii)EOQ or standard order: It's the difference between max and min order quantity.

iv)Reorder point: This is the point where we have to initiate the purchase order.

v)Lead time: It is the time difference between placing order time and material receiving time.

2.**ABC Model**



In this model material is classified into three class A class B and class C.

1)Class A: It consists 10 % of the total no of items and 70 % of the total money value for all the items. High value item, high control and security is required.

2)Class B: It consists 20 % of the total no of items and 20 % of the total money value for all the items. It's between Class A and Class C moderately control materials.

3)Class C: It consists 70 % of the total no of items and 10 % of the total money value for all the items. It consist low value material.

	or			

XII	<table><tr><th>Sl. No.</th><th>PERT</th><th>CPM</th></tr><tr><td>1</td><td>It is a probabilitic model with uncertainity in activity duration</td><td>A deterministic model with well known activity timing</td></tr><tr><td>2</td><td>Has 3 time estimaste</td><td>Has only 1 time estimate</td></tr><tr><td>3</td><td>Event oriented technique</td><td>Activity oriented technique</td></tr><tr><td>4</td><td>Suitable in defence, R&D Projects</td><td>Suitable for civil, construction work, mechanical works, scheduling of paint maintenance etc.</td></tr><tr><td>5</td><td>Does not give importance to critical path</td><td>Gives due importance to critical path</td></tr><tr><td>6</td><td>It uses statistical method to calculate expected time</td><td>Need not require statistical techniques</td></tr></table>	Full form 1 + 6 points each (6x1)	7	7
XIII	**Functions of management** 1. Planning 2. Organizing 3. Staffing 4. Directing 5. Controlling Write one sentence for each point	List out 2+ Explain 5x1	7	7
	or			
XIV	**i)Activity:** It is an individual operation which consumes resource and time. It has beginning and end. An arrow represents an activity **ii)Event:** Event represent a point in time where completion of some activity and beginning of new activity. A circle represents a node. **iii)EFT (Earliest finish time):** This is the earliest possible time at which an activity can finish. This is represented on the top right corner outside operation in a rectangle. **iv)LFT (Latest finish time):** It is the total time by which and activity should be completed. It is represented by triangle. **v)Slack:** It is the difference between LFT and EFT. In critical path slack or float will be zero.	i) 1 mark ii) 1 mark iii) 2 marks iv) 2 marks v) 1 mark	7	7