

38

SCHEME OF EVALUATION
(Scoring Indicators)

Appl-24
Page No - 14

Revision:15

Course Title:INDUSTRIAL MANAGEMENT AND SAFETY

Course Code:5001

Qst No	Scoring Indicator	Split up score	Sub total	Total
PART A				
Qn No: I.1	Definition 1: The process of dealing with or controlling things or people. Definition 2: Management is the art of knowing what you want to do and then seeing that it is done in the best and cheapest way			
I.2	Process by which management determines how the organization should move from its current manpower position to its desired manpower position through this planning, management strikes to have both the organization and the individual receiving maximum long run benefits.	2 for any one definition	2	2
I.3	A quality plan is a document, or several documents, that together specify quality standards, practices, resources, specifications, and the sequence of activities relevant to a particular product, service, project, or contract.	2	2	2
I.4	Network Analysis is the technique is used to solve projects like one industrial, military etc. It is dividing complex job into small jobs and represent graphically to easily analysis and solving it.	2	2	2
I.5	Frequency rate: Frequency rate is the number of occupational accidents with leave for 1 000 000 worked hours. Frequency rate = [(number of accidents with sick leave X 1 0 ⁶) / number of worked hours] Severity rate: The rate of severity represents the number of days compensated for 1000 worked hours, that is the number of days lost by temporary disability for 1 000 worked hours. Severity rate = [(number of days compensated x 1000) / number of worked hours]	1 marks each	2	2

Scoring Indicator

PART B

Qst No	Scoring Indicator	Split up score	Sub total	Total
II (1)	<p>The benefits of training can be summed up as:</p> <ul style="list-style-type: none"> • Improves morale of employees- Training helps the employee to get job security and job satisfaction. The more satisfied the employee is and the greater is his morale, the more he will contribute to organizational success and the lesser will be employee absenteeism and turnover. • Less supervision- A well trained employee will be well acquainted with the job and will need less of supervision. Thus, there will be less wastage of time and efforts. • Fewer accidents- Errors are likely to occur if the employees lack knowledge and skills required for doing a particular job. The more trained an employee is, the less are the chances of committing accidents in job and the more proficient the employee becomes. • Chances of promotion- Employees acquire skills and efficiency during training. They become more eligible for promotion. They become an asset for the organization. • Increased productivity- Training improves efficiency and productivity of employees. Well trained employees show both quantity and quality performance. There is less wastage of time, money and resources if employees are properly trained. 	Any 4 points -1.5 marks each	6	6
II (2)	<ol style="list-style-type: none"> 1. Determining the conformity or non-conformity of the quality system elements with specified requirements. 2. Ensuring whether the products are fit for use, safe for the consumers and regulations are being followed. 3. There is conformance to specifications and that written procedures are suitable and are being followed. 4. Finding out whether the quality policies of organisations meet quality standards adequately. 5. The data system is able to provide adequate information on quality to all concerned. 6. Corrective action is taken with respect to deficiencies. 	1 mark for each point	6	6

Qst No	Scoring Indicator	Split up score	Sub total	Total
II (3)	<ol style="list-style-type: none"> 1. Analyze market 2. Study consumer habits and taste. 3. Study about competitor. 4. Sales research and planning. 5. Demand creation. 6. Advertising 7. Decide distribution network and policy. 8. Sales costs and budget. 9. Price fixations. 10. Development of products. 	Any 6 points - 1 mark each	6	6
II (4)	<p>CPM application</p> <ol style="list-style-type: none"> 1. Construction of civil and mechanical projects 2. Electrical and electronic product manufacturing and assembling 3. Equipment maintenance 4. Setting up new industry <p>PERT Application</p> <ol style="list-style-type: none"> 1. Research and development activity 2. Military operations 3. Design and development of new product. 4. Weather forecasting. 	Any 3 points - 1 mark each	3*2	6
II (5)	<p>Game theory is used for decision making under conflicting situations ie where there are one or more opponents. In game theory it's called players. Example: Election success of one person will lead failure of other.</p> <p>Saddle point is position of such an element in the payoff matrix which is the minimum in its row and max in its column.</p>	game theory 3+ 1 (example) , Saddle point - 2 marks	4+2	6

Scoring Indicator

Qst No		Split up score	Sub total	Total
II (6)	<p>1. The Safety Officer is responsible for monitoring and assessing hazardous and unsafe situations.</p> <p>2. Developing measures to assure personnel safety.</p> <p>3. Correct unsafe acts or conditions through the regular line of authority.</p> <p>4. May exercise emergency authority to prevent or stop unsafe acts when immediate action is required.</p> <p>5. The Safety Officer maintains awareness of active and developing situations.</p> <p>6. Ensures there are safety messages in each Incident Action Plan.</p> <p>7. Participate in planning meetings to identify any health and safety concerns inherent in the operations daily work-plan.</p> <p>8. Review the Incident Action Plan for safety implications.</p> <p>9. Investigate accidents that have occurred within incident areas.</p> <p>10. Ensure preparation and implementation of Site Safety and Health Plan.</p>	Any 6 points -1 mark each	6	6
II (7)	<p>1. Manage business</p> <p>2. Take decisions</p> <p>3. Select plant size and site</p> <p>4. Promote new inventions</p> <p>5. Decide pricing policy</p> <p>6. Coordinate</p> <p>7. Employ the labors</p> <p>8. Arrange raw material machines and finance.</p> <p>9. Distribute wages</p> <p>10. Deal with govt departments.</p>	Any 6 points -1 mark each	6	6

Qst No	Scoring Indicator	Split up score	Sub total	Total
III(a)	<p style="text-align: center;">PART C</p> <p>Managerial Functions Planning: Planning is determination of courses of action to achieve desired goals. Organizing: Organizing process of bringing together physical, financial and human resources and developing productive relationship amongst them for achievement of organizational goals.</p> <p>Staffing: Managerial function of staffing involves manning the organization structure through proper and effective selection; appraisal & development of personnel to fill the roles designed in the structure. Directing: Direction is that inert-personnel aspect of management which deals directly with influencing, guiding, supervising, motivating sub-ordinate for the achievement of organizational goals. Controlling: Controlling is the measurement & correction of performance activities of subordinates in order to make sure that assure the enterprise goal.</p> <p>Operative Functions Employment: The first operative function of the human resource of personnel department is the employment of proper kind and number of persons necessary to achieve the goal of the organisation. This involves recruitment, selection, placement, etc. of the personnel. Development: Training and development of personnel is a follow up of the employment function. It is a duty of management to train each employee properly to develop technical skills for the job for which he has been employed and also to develop him for the higher jobs in the organization. Compensation: This function is concerned with the determination of adequate and equitable remuneration of the employees in the organisation of their contribution to the organisational goals. The personnel can be compensated both in terms of monetary as well as non-monetary rewards. Maintenance (Working Conditions and Welfare): Organization must be provided with good working conditions so that they may like their work and workplace and maintain their efficiency. Working conditions certainly influence the motivation and morale of the employees. Motivation: The human resource manager helps the various departmental managers to design a system of financial and non-financial rewards to motivate the employees. Personnel Records: The human resource or personnel department maintains the records of the employees working in the enterprise. It keeps full records of their training, achievements, transfer, promotion, absenteeism etc. Industrial Relations: These days, the responsibility of maintaining good industrial relations is mainly discharged by the human resource manager. The human resource manager can help in collective bargaining, joint consultation and settlement of disputes, if the need arises. Separation: Since the first function of human resource management is to procure the employees, it is logical that the last should be the separation and return of that person to society.</p>	<p>Managerial any 4 points 1 mark each, operative functions any 3 points 1 mark each</p>	4+3	7

Qst No	Scoring Indicator	Split up score	Sub total	Total
III(b)	<p>Types of ownership</p> <ol style="list-style-type: none"> 1. Sole proprietorship 2. Partnership 3. Joint stock company <ol style="list-style-type: none"> a. Pvt Ltd b. Public Ltd company 4. Cooperative society <p>Sole proprietorship: A sole proprietorship is a business that has a single owner who is responsible for making decisions for the company. Example: Printing Press Advantages: Flexible to control, Secrecy, Ease of ending, Disadvantages: Limited life span, Limited capital.</p> <p>Partnership: Partnership consists of two or more individuals who share the responsibility of running the company. Example: Cinema theatre Advantages: Large capital, combined knowledge and skills Disadvantages: Disagreement, Low life span, Sharing of profit.</p> <p>Pvt Ltd: Pvt Ltd is a joint stock company incorporated under the Indian Act 2013 or any other previous act. 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. It restrict transfer of shares and prohibits invitation to the public for the subscription of shares and debentures. Example: Factory Advantages: Limited liability and unlimited life span. Disadvantages: Tax to be paid once dividend received. Members cannot exceed 50.</p> <p>Public Ltd company: Public Ltd company Pvt Ltd is a joint stock company incorporated under the 2013 or any other previous act. It's is an association of persons formed voluntarily having the minimum capital of Rs. 500,000. There is no defined limit on the number of members the company can have and restriction on the transferability of the shares. The company can invite public for the subscription of debentures. Example: Engineering firm: BHEL Advantages: Limited liability, Unlimited life span. Disadvantages: Tax to be paid once dividend received level of transparency.</p> <p>Cooperative society: Form of organization where in persons voluntarily associate together as human basis of equality for the promotion of their economic interest. Example: Indian farmers fertilizers cooperative Advantages: Easy to form, Limited liability, Main motive is service. Disadvantages: Lack of secrecy, corruption.</p>	2 per types	2*4	8

Qst No	Scoring Indicator	Split up score	Sub total	Total
IV (a)	<p>Division of work: According to this principle, work should be divided among individuals and groups according to their skills and knowledge. This helps in completing the work with greater efficiency.</p> <p>Authority and responsibility: Authority is a right of an individual to give orders and instructions. Responsibility is a state of being accountable for the consequences of the decisions taken by an individual.</p> <p>Discipline: Discipline in an organisation refers to the obedience to authority. Employees must obey and respect the governing policies and rules of the organisation.</p> <p>Unity of command: According to this principle, employees associated with a particular type of work should report to one superior only. This helps in avoiding confusions in the role of the employees.</p> <p>Unity of direction: It means that there should be one direction in which employees must move to achieve a particular objective. If employees get pulled into different directions, it may be difficult for them to achieve the objective.</p> <p>Subordination of individual interest to general interest: In this principle, Fayol laid emphasis on aligning individuals' personal goals to organisational goals.</p> <p>Remuneration: There should be provision of fair wages for workers. The calculation of wages should be done by considering various factors, such as business environment, cost of living, capacity of organisation to pay, and productivity of employees.</p> <p>Centralization: According to Fayol, the degree of centralisation should be decided to make the optimum utilisation of employees' skills.</p> <p>Scalar chain: Scalar chain refers to the hierarchy followed in an organisation from top managers to employees working at lower levels. In scalar chain, all communication should pass through proper channels of hierarchy.</p> <p>Order: Order is required for the efficient coordination of all the elements in an organisation. Management must follow the principle of the right place for everything and every man.</p> <p>Equity: The principle of equity means fair treatment of all employees. Management must treat all employees equally and should be free from biases and prejudices.</p> <p>Stability of tenure of personnel: Management must strive to stabilise the tenure of employees by providing them job security. Increased turnover always results in inefficient production; therefore, organisations must attempt to reduce it by improving employee morale and motivation.</p> <p>Initiation: Management must provide freedom to employees so that they can carry out orders effectively. Employees should be encouraged to take initiatives in their respective fields in order to perform their jobs efficiently.</p> <p>Espirit Decorps: It refers to team spirit. Management must adopt new ways to improve team spirit among employees. This helps employees to work in harmony.</p>	0.5 marks per point	0.5*14	7

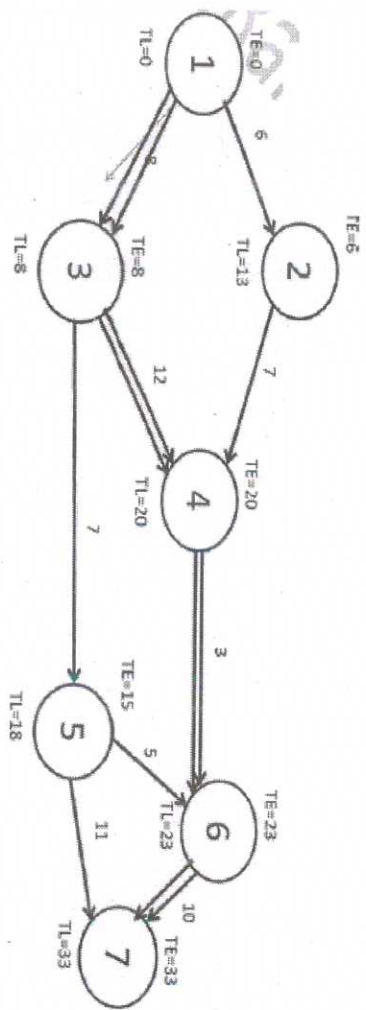
Qst No	Scoring Indicator	Split up score	Sub total	Total
IV (b)	<p>Type of wages</p> <p>Nominal wages: Nominal wages are the wages received by a worker in the form of money.</p> <p>Real Wage: Real wage includes the amount needed to necessities, comforts, luxuries and cash payments which a worker can get in return of his effort and work.</p> <p>Minimum Wage: A minimum wage is a compensation to be paid by an employer to his workers irrespective of his ability to pay.</p> <p>Living Wage: A living wage is one which should enable the earner to provide for himself and his family not only the bare essentials of food, clothing and shelter but a measure of frugal comfort including education for his children, protection against ill-health, requirement of essential social" needs and a measure of insurance against the more important misfortunes, including old-age. Thus, a living wage represents a standard of living.</p> <p>Fair Wage: Fair wage, according to the committee on Fair Wage, is the wage which is above the minimum wage but below the living wage. The lower limit of the fair wage is obviously the minimum wage; the upper limit is set by the capacity of the industry to pay. The concept of fair wage is essentially linked with the capacity of the industry to pay.</p>	Any 4	2x4	8
V(a)	<ol style="list-style-type: none"> 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. 	Any 7	7x1	7

Qst No	Scoring Indicator	Split up score	Sub total	Total
V(b)	<p>Centralized stores A centralized store is that store which receives materials for and issues them to all departments, divisions and production floors of the company. The materials required for all the departments and branches are stored and issued by only one store. The followings are the main advantages of centralized stores.</p> <ol style="list-style-type: none"> 1. A better supervision of store is possible because the store is located under a single supervision. 2. A better layout of store and its control are possible. 3. Less space is occupied. 4. Investment in stock is minimized. 5. It is economical for storing materials. 6. Safety of materials is possible according to the nature of materials. 7. Trained and specialized persons can be appointed. 8. Wastage of materials can be minimized. <p>The followings are the main disadvantages of centralized stores.</p> <ol style="list-style-type: none"> 1. Delay in sending materials to the departments and branches. 2. Increase in material handling cost. 3. Greater risk of loss by fire. 4. Not suitable for a large company. <p>Decentralized Stores A decentralized store is that type of store which receives materials for and issues them to only one department and not to the whole company. The decentralized store may be in many numbers in the company, as each department has its own such store.</p> <p>Advantages Of Decentralized Stores</p> <ol style="list-style-type: none"> 1. Controlling and storing function can be accomplished easily. 2. Delay in material handling will be eliminated. Minimizes the chances of loss by fire. 3. No need of internal transportation costs. Specific needs of individual departments can be easily fulfilled. 4. Saving in material handling cost. <p>Disadvantages Of Decentralized Store</p> <ol style="list-style-type: none"> 1. Higher cost of supervision. 2. More space is required for individual departments. 3. Higher amount of investment is required. More time for stock taking and taking. 4. Higher cost of staff and stationary. Improved technique is less possible for controlling of materials. 	4 x 2	8	8

Qst No	Scoring Indicator	Split up score	Sub total	Total
VII(a)	<p>ISO 9000 is defined as a set of international standards on quality management and quality assurance developed to help companies effectively document the quality system elements needed to maintain an efficient quality system. They are not specific to any one industry and can be applied to organizations of any size.</p> <p>ISO 8402: Provides basic concept about quality policy, Traceability etc.</p> <p>ISO 9001: Ensures quality from designs, development, production installation and service.</p> <p>ISO 9002: It uses Installation and implementation.</p> <p>ISO 9003: It uses for final test and inspection</p> <p>ISO 9004: Guidelines for technical administration, humanity factors which is affecting quality of product etc. Which uses only for internal use.</p>	<p>for iso 9000 2 marks and for each series 1 mark each</p>	2+5	7
VI(b)	<p>a) Single tender: the tender invite from one reliable supplier only. This system of purchasing is used under following conditions.</p> <ul style="list-style-type: none"> <input type="checkbox"/> For purchasing monopolistic items <input type="checkbox"/> When qualities of extreme importance <input type="checkbox"/> For purchasing C class items <input type="checkbox"/> When items are required urgently <p>b) Spot quotation. This system of purchasing is used when purchases are to be carried out very urgently. The buyer goes to market and collects minimum of 3 quotations of items and purchase from the supplier quoting lowest rates.</p> <p>c) Open tender also called press tender or advertised tender. It is published in news papers, journals, etc. for procuring materials of desired specifications. This system is used when local vendors are not available or rates quoted by them are high.</p> <p>d) Limited tender: Representatives of various sales organizations often approach various organizations to register themselves as a vendor. In this system few reliable vendors are to send written letters the price and other details for particular commodity.</p>	2 marks each	2*4	8
VII(a)	<p>$X_{11} = 4, X_{12} = 2, X_{22} = 5, X_{23} = 3, X_{33} = 4, X_{34} = 13$</p>	answer 6 + figure 1	6+1	7

Scoring Indicator

Qst No	Scoring Indicator	Split up score	Sub total	Total										
VIII(b)	<p>EFTT (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.</p> <p>LFTT (Latest finish time): It is the total time by which and activity should be completed. It is represented by triangle.</p> <p>Critical path: The path in which a LFTT and EFTT are equal is called critical path. It can be represented by double line</p> <p>Slack or float: It is the difference between LFTT and EFTT. In critical path slack or float will be zero.</p>	2 marks per question	2*4	8										
VIII(a)	<p>To get graphical solution of above problem Max $Z = 2x + 1.25y$</p> <p>Constraints $1/2 x + 1/3 y \leq 130$-----1 $1/2 x + 2/3 y \leq 170$-----2</p> <p>Solution Replace \leq or \geq with $=$ in equations $1/2 x + 1/3 y = 130$-----1 Put $x=0$ in eqn 1 $x=0$ then $y=390$ Put $y=0$ in eqn 1 $y=0$ then $x=260$ $1/2 x + 2/3 y = 170$-----2 Put $x=0$ in eqn 2 $x=0$ then $y=260$ Put $y=0$ in eqn 2 $y=0$ then $x=260$ Draw graph and find end points</p> <div style="text-align: center;"> </div> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: left;">Substitute the end points in max z</th> <th style="text-align: left;">Value of $z = 2x + 1.25y$</th> </tr> </thead> <tbody> <tr> <td>Extreme point (0, 0)</td> <td>0</td> </tr> <tr> <td>(0, 255)</td> <td>318.75</td> </tr> <tr> <td>(180, 120)</td> <td>510.00</td> </tr> <tr> <td>(260, 0)</td> <td>520.00</td> </tr> </tbody> </table> <p>The table shows that the largest value for z is 520.00 and the corresponding optimal solution is (260, 0). Thus the candy manufacturer attains maximum sales of \$520 when he produces 260 pounds of mixture A and none of mixture B.</p>	Substitute the end points in max z	Value of $z = 2x + 1.25y$	Extreme point (0, 0)	0	(0, 255)	318.75	(180, 120)	510.00	(260, 0)	520.00	constraints 2+ graph 3 +final answer 2	2+3+2	7
Substitute the end points in max z	Value of $z = 2x + 1.25y$													
Extreme point (0, 0)	0													
(0, 255)	318.75													
(180, 120)	510.00													
(260, 0)	520.00													

Qst No	Scoring Indicator	Split up score	Sub total	Total
VIII(b)	 <p>(Network diagram)</p> <p>Project duration is 33 weeks Critical path is 1-3-4-6-7</p>	figure 3 marks, critical path 3, project duration 2 marks	3+3+2.	8
IX(a)	<p>Mechanical factors :</p> <ol style="list-style-type: none"> 1. Improper machine guarding 2. Unsafe construction 3. Defective devices 4. Unsafe apparel 5. Leaking acid valves 6. Broken safety guards <p>Environmental factors</p> <ol style="list-style-type: none"> 1. High temperature 2. High humidity 3. Excessive dust 4. High noise 5. Lengthy working hours 6. Poor house keeping <p>Personal factors.</p> <ol style="list-style-type: none"> 1. Age 2. Financial situation 3. Family 4. Stress 5. Attitude 6. Carelessness 7. Drugs 	Mechanical factors any 4, environmental any 4 and personal factors any 6	2+2+3	7

Qst No	Scoring Indicator	Split up score	Sub total	Total
IX(b)	<p>A feasibility report or business plan is a written statement of what we hope to achieve in business and how. It will give step by step idea how to reach destination.</p> <p>A business plan or feasibility report contain the following</p> <ol style="list-style-type: none"> 1. What product/service 2. How the business achieve the goals 3. When it will produce 4. Why is the business? 	<p>explanation 4 marks, contents 4 marks</p>	4+4	8
X(a)	<p>Content of report</p> <ol style="list-style-type: none"> 1. Summary 2. Introduction 3. Project location 4. Land and building 5. Plant and machinery 6. Assets 7. Production process and program 8. Raw material manpower and other utilities. 9. Market demand analysis. 10. Requirement of fund. 11. Cost of production and profit expected. 12. Break even analysis 13. Implementation scheme 14. Payment schedule <p>1. Engineering 2. Education 3. Enterprising 4. Enforcement</p> <p>Engineering Methods: This involves using of proper machine tools, proper transport use protective devices, alarm system, evacuation plan in case of fire etc.</p> <p>Education: Educate employees to practices to be followed to ensure safety. I can be done through induction, training, using proper supervisor, forming safety committees etc.</p> <p>Enterprising: It's developing safety consciousness to the workers and management. By providing prizes for keeping zero accidents, Cross mark all accident area, safety postures, safety training, lectures etc.</p> <p>Enforcement: It's forcing everyone to follow the rules. Everyone should be contributed to get ensure safety.</p>	<p>naming 4 marks, explanation 3 marks</p>	4+3	7

Qst No	Scoring Indicator	Split up score	Sub total	Total
X(b)	<ol style="list-style-type: none"> 1. Decide the product through survey, using knowledge skill etc. 2. Prepare project report. 3. Decide type of ownership 4. Decide factory location. 5. Buy land or rent a place. 6. Invite quotation for machinery and equipment. 7. Apply for registration 8. Plan finance 9. Apply loan and follow-up. 10. Place order for machinery. 11. Apply for power 12. Plan layout of machinery. 13. Apply for tax card. 14. Apply for raw material. 15. Recruit more staff. 16. Conduct trail. 17. Decide pricing and marketing 18. Maintain account 19. Concentrate on production and sales. 	any 16 points - 0.5 mark each	0.5 x 16	8