TED (21)– 5001 **Reg. No……..**

REVISION 2021 **Signature……**

FIFTH SEMESTER DIPLOMA EXAMINATION IN ENGINEERING AND TECHNOLOGY/COMMERCIAL PRACTICE /MANAGEMENT, NOVEMBER - 2024

INDUSTRIAL MANAGEMENT AND SAFETY

Time: 3 hours **Maximum Marks: 75**

QN.NO	SCORING INDICATORS	SPLIT SCORE	SUB TOTAL	TOTAL SCORE
	PART -A			**9**
1	(i) Record keeping (ii) Personnel planning	**1**	**1**	
2	i. Developed principle of breaking a task (job) into elements for timing the same. ii. Conducted exploration on causes of inefficiency and labour difficulties in industry	**1**	**1**	
3	Quality is defined as "the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs".	**1**	**1**	
4	International Organization for Standardization	**1**	**1**	
5	i.To create an excellent culture ii. Produce quality product	**1**	**1**	
6	Path on the network along which no slippage is allowed. In this path slack is negative or zero	**1**	**1**	
7	Accident proneness may be defined as the continuing tendency of a person to have more accidents as a result of his persisting characteristics.	**1**	**1**	
8	Unpleasant and unwanted sound is called noise.	**1**	**1**	
9	Accident may be defined as a disaster that results some sort of injury /damage to men, machine and tools during working in an industry.	**1**	**1**	
	PART -B			**24**
1	i) Developed principle of breaking a task (job) into elements for timing the same. ii. Conducted exploration on causes of inefficiency and labour difficulties in industry. iii. Evolved certain principles of investigating work on scientific basis, selecting best worker for the task, training him to acquire desired skill, developing cooperative spirit between management and workers, almost equal division of work between workers and management. iv. Concept of a 'fair day's task' (need for planning work). Also undertook studies on fatigue incurred by workers and the time necessary to complete a task.	**1** **1**	**3**	

	v. Taylor developed functional organization in which one foreman was made in charge for each function. vi. Devoted maximum attention towards time studies and establishing work standards. vii. Introduced and operated various costing systems. viii. Suggested a wage incentive scheme known as Taylor's Differential Piece rate system.	**1**		
2	i. Voluntary association ii. Democratic management iii. Not profit motive iv. Self-help and mutual help v. Open door policy vi. Distribution of surplus	**1** **1** **1**	**3**	
3	Total Quality Management (TQM) is the integration of all functions process and personnel within the organization in order to achieve the continuous improvement of the quality of services which allow for full customer satisfaction.	**3**	**3**	
4	While locating the stores the size of the industries to which it is attached is taken into account and other factors considered are bulk of material that arrives to stores, amount of material to be handled during issues to various sections daily. Sore may be located as centralized store or decentralized store.	**3**	**3**	
5	Event is the start or completion of a task represented by circle or node and do not consume time and resources. Activity is the actual performance of a task which consumes time and resources such as manpower, time etc. It is represented by the line and arrow.	**1.5** **1.5**	**3**	
6	a) Pre-operation is the operation which precedes the operation under consideration. b) Post operations (successor activity) are the operation which follow after the operation under consideration is completed. c) An activity which only shows the dependency, logic or relationship of one activity over another is known as dummy activity.	**1** **1** **1**	**3**	

7	**A) C.P.M** i) Construction of civil and mechanical projects ii) Electrical and electronic product manufacturing and assembling iii) Equipment maintenance, plant maintenance, over holding etc iv) Setting up new industries v) Shifting manufacturing location from one place to another	**1.5** **1.5**	**3**	
8	i. Age and health of employees ii. Home environment iii. Financial position iv. Number of dependents v. Lack of knowledge and skill vi. Improper attitude towards work	 **1.5** **1.5**	**3**	
9	A) i. Frequency rate is defined as the number of accidents occured per million man hours worked in a year. Frequency rate=number of lost time accidents X 1000000/TOTAL NO. OF MAN HRS. WORKED ii. Severity rate is defined as the number of man days lost per million man hours worked in a year. ie Severity rate =NUMBER OF MAN DAYS LOST X 1000000/TOTAL NUMBER OF MAN HOURS WORKED. iii. Incidence rate is defined as the number of occupational injuries and /or illness of lost workdays per full hundred full time employees.ie Incidence rate=NUMBER OF INJURIESX10000/TOTAL NUMBER OF EMPLOYEES	**1** **1** **1**	**3**	
10	i. Licensing and registration ii. health iii. safety iv. welfare v. hours of work vi. employment of young person restrictions vii. leave	**1.5** **1.5**	**3**	

	PART -C			**42**
III	i. After conducting job analysis, prepare job description and job specification ii. Determine various sources of recruitment such as employment exchange, newspaper advertisement, campus interview etc iii. Preparation of application format iv. Calling for a selection test after preliminary filtration. Selection tests may be performance test, aptitude test, intelligence test, interest test etc. v. Conducting the selection test where considered necessary vi. Performing preliminary interview after selection test. Interview may be informal or formal vii. Conducting medical examination of the applicant where it is required viii. Conducting final selection interview with candidates ix. Selecting and appointing persons selected in final interview	**1** **1** **1** **7** **1** **1** **1** **1**		
	OR			
IV	i. An application submitted to registrar of co-operative societies of state ii. There must be at least 10 members who are competent to contract iii. Application should state clearly name, place, objective, capital structure, sources fund for the society etc. iv. Bye laws to be drafted for the society v. These bye laws are the rules and regulations in accordance with which society will function vi. Along with application,2 copies of bye-laws and prescribed registration fees are submitted to the registrar vii. If registrar is satisfied, he will issue a certificate of registration after which society will admit members, collect share capital and commence business.	**1** **1** **1** **1** **1** **1** **1**	**7**	

V	In this system, a committee of persons who are familiar with the jobs and job description carries out the ranking. They study all the jobs and job descriptions in the organization, and they are arranged or ranked in ascending order beginning with the one of minimum requirements and ending up with one of maximum requirement. While ranking, the following factors are considered. i. Amount of work ii. Supervision needed iii. Responsibility required iv. Difficulty in work v. Monotony of work vi. Working conditions vii. Knowledge and experience needed Ranking system is suitable for smaller organizations where the rates are thorough with all existing jobs in the enterprise.	**1** **1** **1** **1** **1** **1** **1**	**7**	
	OR			
VI	A) i. Problem for analysis is defined and the conditions for observation determined ii. Observations are made under different conditions to determine the behaviour of the system containing the problem. iii. Based on the observations, a hypothesis that describes how the factors involved are thought to interact or what is the best solution to the problem conceived iv. To test the hypothesis an experiment is designed v. The experiment is executed and measurements are obtained and recorded. vi. Results of the experiment are analysed and the hypothesis is either accepted or rejected.	**1** **1** **1** **1** **1** **1** **1**	**7**	
VII	**A** i Quality is never an accident. It is always the result of untiring and intelligent effort. ii. Quality is like a prayer to GOD. Which never comes out without hard work and devotion. iii. Quality is everybody's work. iv. Take care of quality, quantity will take care of itself. v. Document is dependable, but not the memory.	**1** **1** **1** **1** **1**	**7**	

	vi. Quality begins with clean lines of workplace. vii. Quality is achieved through teamwork. viii. Quality begins and ends with education. ix. Quality is the attribute that a customer uses to evaluate products and services. x. Make it right for first time an all times.	**1** **1** **1**		
	OR			
VIII	A) ISO – 9000 helps to i) Organization in promoting their products in international market ii) Organizations in creating confidence to the customers regarding the product quality which improves profits. iii) Organizations in withstanding competition from other producers of product in the global market iv) Suppliers in improving the quality of new materials, semi-finished and finished products. v) Consumers in getting good quality products. vi) The quality system improves the efficiency, reduces the wastages, inspections and also rework.	**1** **1** **1** **1** **1** **1**	**7**	
IX	A) Purchasing means procuring or buying of materials, Supplies, machinery, machine tools and services etc. needed for production and maintenance of a concern. Objectives of purchasing i. To procure right material ii. To procure material of right quality iii. To procure material in right quantity iv. To procure from right and reliable source and vendor v. To procure and deliver materials at right place at right time vi. To procure material in right prices.	**1** **1** **1** **1** **1** **1** **1**	**7**	

	OR			
X	A) i. Purchase requisition ii. Selection of possible sources of supply iii. Determining the time, price, quality and quantity iv. Making request for quotations v. Receipt and analysis of quotations vi. Selection of right sources of supply vii. Placing the purchase order viii. Following up and expediting of order ix. Inspection x. Checking and approving vendor's invoices for payment xi. Closing completed orders	**4** **3**	**7**	
XI	A) PERT stands for Programme Evaluation and Review Technique. It is a network technique for planning, monitoring and controlling the projects. **3 Time estimate for PERT are** a) Optimistic time: It is the minimum time in which an activity can be completed under ideal conditions denoted by (to) b) Pessimistic time (tp) is the maximum possible time in which an activity can be completed under worst conditions, assuming every possible delay and difficult situations. c) Most likely time (tm) is the time in which an activity can be completed under normal conditions assuming that everything goes on in the normal way. d) [Expected time (e) is the average time in which an activity can be completed as calculated from the formula] $te = (to+4tm+tp)/6$	**4** **3**	**7**	
	OR			
XII	**CPM** i)Activity oriented system ii) Deterministic model with well-known activity times based on past experience iii) Expected time is actual time taken iv) Uses terminologies like arrow diagram nodes, and float v) Use of dummy activity not necessary vi) Marks critical activities vii) Suitable for plant maintenance, construction projects **PERT** **i)** Event oriented **ii)** Probabilistic model with uncertainty in activity duration **iii)** Expected time is calculated from td, tm and tp **iv)** Uses terminologies like network diagram, events and slack **v)** Dummy activities required for representing proper sequencing **vi)** Does not demarcate between critical & non-critical activities **vii)** Suitable for defence projects and R & D works	**4** **3**	**7**	

XIII	**A) <u>PERSONAL FACTORS</u>** i. Age and health of employees ii. Home environment iii. Financial position iv. Number of dependents v. Lack of knowledge and skill vi. Improper attitude towards work vii. Carelessness and recklessness viii. Improper usage of tools and equipment ix. Incorrect machine habits x. Day dreaming xi. Fatigue xii. Emotional instability xiii. Mental worries xiv. Unnecessary exposure to risk xv. High anxiety level xvi. Non-use of safety devices xvii. Working at unsafe speed **<u>MECHANICAL FACTORS</u>** i. Improper machine guarding ii. Unsafe mechanical design or construction iii. Defective devices iv. Improper material handling v. Broken safety guards 2 **<u>ENVIRONMENTAL FACTORS</u>** i. Too low temperature to cause shivering. ii. Very high temperature for head ache and sweating. iii. Too high humidity for un comfort, fatigue, drowsiness and asthmatic complaint etc.	**2** **2** **2** **1**	**7**	
	OR			

XIV	**A)** Solid wastes are unwanted or discarded waste materials from houses, hospitals, street sweeping, commercial, industrial and agricultural operations and others arising from man's activities. **Methods of solid waste management** i. Dumping --Refuse dumped in low lying areas as a method of reclamation of land. As a result of bacterial action, refuse decreases and converted to humus. ii. Sanitary land filling-Trenches are excavated and filled the refuses to depth of 2 to 2.5 m, and covered with excavated earth. iii. Incineration-involves burning combustible refuse in an incinerator. All sorts of bacteria, insects etc are destroyed and remaining non-combustible ashes, metals etc have little sanitation problem. iv. Composting-is a method of combined disposal of reuse and sludge which is a process of nature. Organic matter breakdown under bacterial action and results in formation of compost. v. Ploughing in fields-Used only on small scale grinding and discharging to sewers. Refuse is well ground in house or commercial grinders and discharged into sewer. vi. Salvaging-Removal of certain elements such as paper, rags, glass, plastics, scrap metals etc. from sewage having market value. vii. Fermentation or biological digestion-In this garbage is placed in air tight sealed tanks for 10 days, and in presence of air for 15 or 20 days. Digested residue is stable and is good soil conditioner.	**2** **2** **2** **1**	**7**	