2715

Code : 20PM01T

Register Number | | | | | | | | | | |

II Semester Diploma Examination, March/April-2022

PROJECT MANAGEMENT SKILLS

Time : 3 Hours] **[Max. Marks : 100**

Instructions : (1) Answer all the sections.
(2) Sections **I** and **VI** carries **10** marks each.
(3) Sections **II, III, IV** and **V** carries **20** marks each.

SECTION – I

1. (a) Define project and mention any two projects you see in daily life. **2**

OR

Mention any two features of a project.

(b) Define the meaning of project management. **2**

OR

List the different types of projects.

(c) Explain the role of project manager. **3**

OR

Explain the role of projects consultants.

(d) Describe the project management process. **3**

OR

Analyse the difference between project and operation.

SECTION – II

2. (a) Define project administration and mention any two tools used in project administrative system. **4**

OR

Mention the types of project teams and write atleast two advantages of effective team.

(b) Explain the use of project design concept in any project and discuss the steps involved in it. **6**

OR

Describe the use of Project Procedure Manual (PPM) and Project Execution Plan (PEP) for the successful implementation of the project.

(c) Develop a Work Breakdown structure for the construction of a college building. 5

OR

Develop a Work Breakdown structure for the software development project.

(d) Analyse the importance of communication in a project. 5

OR

Analyse the prerequisites for successful project implementation.

SECTION – III

3. (a) List the different phases of project management life cycle. 4

OR

List any four components of project planning.

(b) As a project manager, discuss the Cost management and Quality management. 6

OR

As a project manager, discuss the change management and procurement management.

(c) Discuss the application of sensitivity analysis technique for the assessment of risk. 5

OR

Discuss the application of scenario analysis technique for the assessment of risk.

(d) A state highway project was planned to implement with an estimated budget of 40 crores. However, after the completion of the project, it was found that the project total cost was 45 crores. Analyse the possible reasons for the increase in cost of the project. 5

OR

A shopping mall construction project was planned with an estimated time duration of 18 months. However, the project took 24 months for its completion. Evaluate the possible reasons for the delay in the project.

SECTION – IV

4. (a) Write the functions of project planning. 4

OR

List the tools used for project planning.

(b) Briefly explain time estimate and its components. 6

OR

Describe situation analysis and mention atleast six techniques to collect information to conduct situation analysis.

(c) Explain the application of "SMART" tool for setting goals and objectives. 5

OR

Describe the application of Gantt chart for project planning.

(d) Analyse the importance of project objectives and policies. 5

OR

Analyse the importance of project evaluation.

SECTION – V

5. (a) List any four purposes of project control. 4

OR

List any four objectives of project review.

(b) Explain the project audit program. 6

OR

Explain the two ways of conducting performance evaluation.

(c) Explain the application of critical path method (CPM) in project management. 5

OR

Explain the application of Program Evaluation and Review Technique (PERT) in project management.

(d) Construct a network diagram for a project whose activities and their predecessor relationship are given below. 5

Activity	A	B	C	D	E	F	G	H	I	J	K
Predecessor	–	–	–	A	B	B	C	D	E	H, I	F, G

OR

Develop the network diagram for the following activities with corresponding time estimate.

Activity	Time estimate		
	t_0	t_m	t_p
1 – 2	9	12	21
1 – 3	6	12	18
2 – 4	1	1.5	5
3 – 4	4	8.5	10
2 – 5	10	14	24
4 – 5	1	2	3

SECTION – VI

6. (a) Discuss the application of cloud technology in project management. 5

OR

Discuss the application of Internet of Things (IoT) in project management.

(b) Discuss on how smart city projects can be developed using digital technologies. 5

OR

Discuss on how digital technologies can be used in Education.

II Semester Diploma Examinations, Mar/Apr-2022

PROJECT MANAGEMENT SKILLS (20PM01T)

Scheme of Valuation

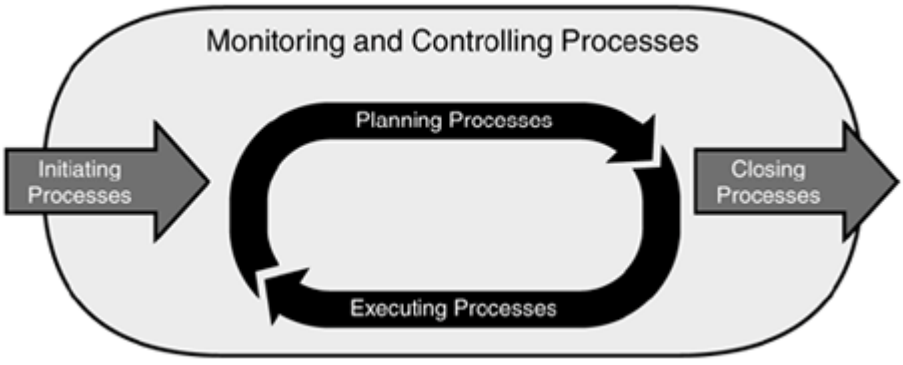
Instructions:

(i) Answer all the sections.
(ii) Sections **I** and **VI** carry 10 marks each.
(iii) Sections **II**, **III**, **IV** and **V** carries 20 marks each.

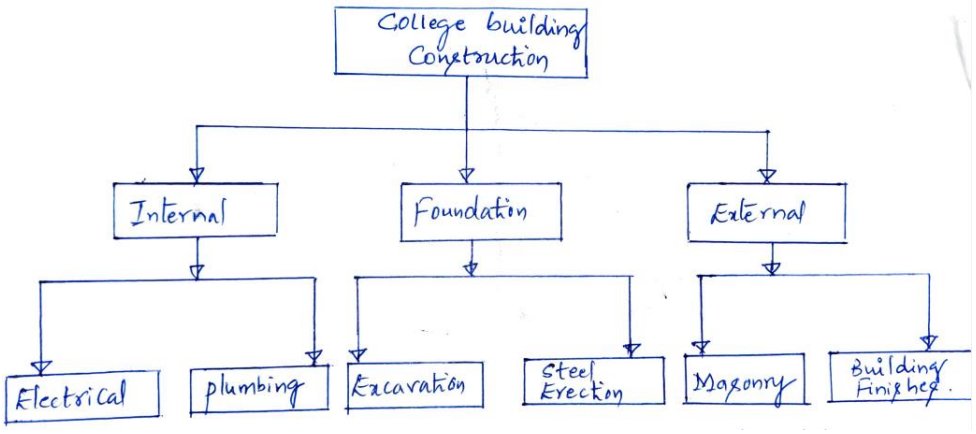
Q. No.	Question breakup	Marks
	Section – I	
1 (a)	Definition and any two examples of project. OR Mention any two features.	01+01 = 02 02x01=02
(b)	Definition. OR List at least 2 types of projects.	02 02x01=02
(c)	Briefly describe the role. OR Briefly describe the role.	03 03
(d)	Brief description. OR Any 3 Difference	03 03
	Section – II	
2 (a)	Definition and any two tools. OR Mention at least four types and two advantages.	02+02=04 02+02=04
(b)	Design concept and three steps. OR Brief description of PPM and PEP.	03+03=06 03+03=06
(c)	WBS for construction of college building. OR WBS for software development.	05 05
(d)	Brief explanation. OR Brief explanation.	05 05
	Section – III	
3 (a)	Four phases. OR Any four components.	04x01=04 04x01=04
(b)	Brief description of cost management and Quality management. OR Brief description of Change management and procurement management.	03+03=06 03+03=06
(c)	Brief explanation. OR Brief explanation.	05 05
(d)	Minimum 05 reasons.	05x01=05

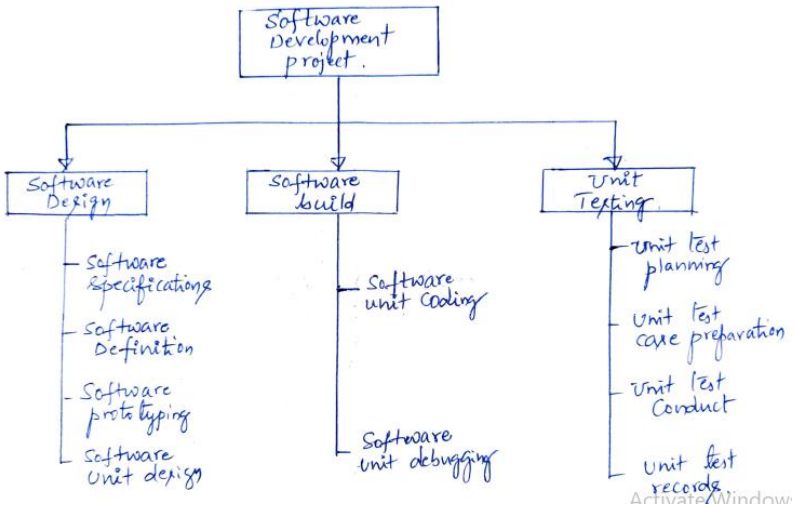
	OR Minimum 05 reasons.	 05x01=05
Section – IV		
4 (a)	Any four functions. OR Four tools.	04x01=04 04x01=04
(b)	Brief description of 3-time components. OR Brief description and six techniques.	03x02=06 03+03=06
(c)	Brief explanation. OR Brief explanation.	05 05
(d)	Brief explanation. OR Brief explanation.	05 05
Section – V		
5 (a)	Any four purposes. OR Any four objectives.	04x01=04 04x01=04
(b)	Brief explanation of 3 steps. OR Brief explanation of two ways.	03x02=06 03+03=06
(c)	Brief explanation. OR Brief explanation.	05 05
(d)	Network diagram. OR Time estimate + Network diagram.	05 02+03=05
Section – VI		
6 (a)	Brief description. OR Brief description.	05 05
6 (b)	Brief explanation. OR Brief explanation.	05 05

Section – I	
1 (a)	Definition 1: In general, project is a work plan which is scientifically devised with right man for the right work at the right time to achieve a specific objective within a certain set time frame. (1) OR Definition 2: Project is a temporary endeavor undertaken to create a unique product or service or result. **(American National Standard Institute ANSI/PMI99-001-2004)** OR Definition 3: Project is a unique process, consist of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective confirming to specific requirements, including the constraints of time cost and resource. **(ISO10006)** OR Definition 4: A project is a one-shot, time limited, goal directed, major undertaking, requiring the commitment of varied skills and requirements. **(Project Management Institute, USA)** Projects in daily life are, construction projects, Railway projects, Highway Projects, Information Technology projects, Manufacturing projects, Health projects, Educational projects Etc. (1) **OR** Some of the features are: (**any two features**) 1) Unique in nature. No two projects are exactly similar. 2) Have definite objectives (goals) to achieve. 3) Require set of resources. 4) Have a specific time frame for completion with a definite start and finish. 5) Project has a life cycle reflected by growth, maturity and decline. 6) Involves risk and uncertainty. 7) Require cross-functional teams and interdisciplinary approach. 8) Change is an inherent feature in any project throughout its life. (2)
1 (b)	Project management is a distinct area of management that helps in handling projects. It has three key features: a project manager, the project team and the project management system. Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. It enable organizations to execute projects effectively and efficiently. (2) **OR** Different types of project are (**any two types**) 1) Normal Projects

	2) Crash Projects 3) Disaster Projects (2)
1 (c)	The role of project manager (**any 3 points**) 1) Project Manager plays a pivotal role in the entire project team and accelerates its activities. 2) He holds the overall control of the project and responsible for its execution and performance. 3) He is involved in planning the work, monitoring, directing and leading the team members and seeks to reach the project goal in time-cost-quality challenge. 4) He should maintain a project dairy to record the activities and progress of the project. 5) He should ensure timely availability of the resources and take necessary action to reduce the wastage of the resources. (3) **OR** The role of project consultants (**any 3 points**) 1) Consultants provide guidance as well as direction to the projects from the formulation state to the completion and post project evaluation state. 2) They provide the advantage of expertise. 3) They fill the gap when there is no in-house facility available. 4) They provide the assistance especially for projects with new technology or imported technology. 5) They assist the Project manager or the project team to achieve cost control and time control. 6) They assist to prepare appropriate estimate and effective and efficient management of the resources. (3)
1 (d)	 It is the application of knowledge, skills, tools and techniques to project activities to meet the project objectives. This involves the application and integration of the five project management process such as initiating, planning, executing, monitoring and controlling and closing. The Project Manager is the person responsible for accomplishing the project objectives. (3)

	OR Difference between project and operation. (**any 3 difference**) 1) Projects are unique and temporary, while operations are ongoing and permanent with a repetitive output. 2) Projects have a fixed budget, while operations have to earn a profit to run the business. 3) Projects are executed to start a new business objective and terminated when it is achieved, while operational work does not produce anything new and is ongoing. 4) Projects create a unique product or service, while operations produce the same product, aim to earn a profit and keep the system running. 5) There are more risks in projects as they are usually done for the first time, while in operations there are fewer risks as they are repeated many times. 6) Projects are performance intensive while operations are efficiency intensive. 7) Projects are managed through project management and operations require business process management. (3)
Section – II	
2 (a)	Project Administration is the process of providing a project management service for the project teams and relieves them of most of the planning, tracking, and reporting responsibility. They assist a project manager by performing many of the administrative tasks required for the smooth running of the project. Some of the tools used for effective projective project administration are: 1) Work Breakdown Structure (WBS) 2) Project Execution Plan (PEP 3) Project Procedure Manual (PPM). (2+2) **OR** Different types of a project teams are : (**Any four types**) 1. Initial project team 2. Project manager 3. Core project team 4. Full project team 5. Project advisors 6. Project stakeholders 7. Process facilitators Various advantages are: (**Any two advantages**) 1. Clear objective of the project from the initiation to completion. 2. Good decision-making, which speed up the activities. 3. Clear roles, responsibilities and leadership, without overlapping, ensure smooth progress.

	4. Trust, co-operation, support and constructive feedback. 5. Individual and mutual accountability for better results. (2+2)
2 (b)	Project design is the first stage in the execution of the project. Project design is concerned with developing project scheduling techniques and implementation of the project. It includes finding of location, construction of buildings, procuring plant and machinery and finally execution the project. Product design along with the network analysis will help us to develop the work plan of the project. The steps involved are: Step 1: Conceive the total physical system and its natural modules. Step 2: Identification of connection between these modules. Step 3: Developing the control system using information as the media to control the project. (3+3) **OR** <u>Project Procedure Manual (PPM)</u> The project procedure manual gives a complete picture about the system. It is intended to guide project managers. It has to be prepared in such a way that the agencies are able to see their roles and mutual relationships in achieving the common goal. Preparation of a project procedure manual should start with each project management sub system. It contains the instruction for handling the project in accordance with the terms of the contract. <u>Project Execution Plan (PEP)</u> The Project Execution Plan is the governing document that establishes the means to execute, monitor, and control projects. It is a document that describes the objectives we wants to achieve in a company with the time and resources needed along with the costs, quality, benefits, etc. PEP includes four sub-plans. These are: 1. Contracting Plan 2. Work packing Plan 3. Organization Plan 4. Systems and Procedure Plan (3+3)
2 (c)	A general WBS for construction of college building.  (5) **OR**

	A general WBS for software development project.  (5)
2 (d)	Effective communication is often the foundation of successful projects. Good communication can unite team members and stakeholders to a project's strategy, objectives and budget. It can also enable everyone involved in the project to understand his or her roles, which may make them more likely to support the project. Without effective communication, projects can incur more risk and fail to meet desired outcomes. According to Peter F Drucker, 63% of management problems are due to faulty communications. For a successful project implementation, a two-way communications system is essential. For that matter, the entire process of direction, co-ordination and control in a project revolves around communication. (5) **OR** Time and cost overruns make the project uneconomical. This also leads to shortage of resources for other projects. In order to minimize time and cost over-runs during the implementation of a project, it is necessary to study about the prerequisites for successful project implementation. Keeping checks on these prerequisites help to improve prospects of successful completion of projects. Some of the important prerequisites are Adequate formulation, sound project organization, proper implementation planning, advance action, timely availability of funds, judicious equipment tendering and procurement, better contract management, effective monitoring. (5)
	Section – III
3 (a)	The four phases of project life cycle are, 1. Initiation 2. Planning 3. Execution 4. Closure or Termination (4) **OR**

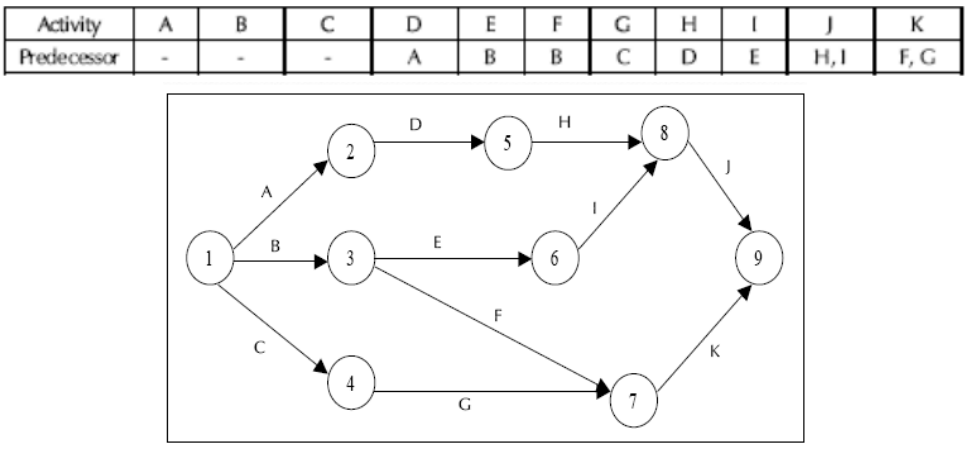
	Following are some of the components of project planning (**Any four components**) 1. Resource plan 2. Financial plan 3. Quality plan 4. Risk plan 5. Acceptance plan 6. Communication plan 7. Procurement plan (4)
3 (b)	Cost management The cost management process monitors and records all costs within a project. The costs are recorded by team members using expense forms. The project manager will review and approve these forms before the expensive items are purchased. The cost management process will help the project team to accurately record all the costs and track them in such a way that the total cost of the project is within the budget of the project. Quality management The project quality management process aims to improve the quality of deliverables produced by the project. The objective of the quality management process is to enhance the ability of the project team to produce deliverables which meet the specifications and satisfy the customer. The quality management process has two components, viz quality improvement process and quality assurance process. (3+3) **OR** Change management The change management is a process in project management which is used to manage all request for change within the project. When the project is evaluated and approved at a beginning, it is with certain specifications. But, when the project is in progress, the sponsor may request certain changes in the specification of the project. As a project team which is working to satisfy the request of the sponsor it is highly essential to incorporate the changes which are suggested by the sponsor in the course of the project execution. Procurement management In project management, mostly the goods and services are purchased from the external sources. Under such situation, the procurement management process will help the project team to purchase goods and services from the external suppliers more efficiently. This process will give a complete

	set of guidelines to issue purchase orders, receive and approve deliveries, endorse supplier payments and manage supplier against their contracts. (3+3)
3 (c)	Sensitivity Analysis is a method that measures how the impact of uncertainties of one or more input variables can affect the output. This analysis improves the prediction of the model by improving the response of model to change in input variables. In sensitivity analysis, typically one variable is changed at a time. Since the future is uncertain, it helps to know what will happen to the viability of the project when some variable like sales or investment deviates from its expected value. It shows how robust or vulnerable a project is to changes in input variables and indicates where further action to be taken. (5) **OR** Scenario analysis is a process of analyzing future events by considering alternative possible outcomes. Scenario analysis is conducted, to analyze the impacts of possible future events on the system performance. Scenario analysis may be regarded as an improvement over sensitivity analysis because it consider variation in several variables together. If variables are interrelated, it will be helpful to look at some likely scenarios, each scenario representing a consistent combination of variables. (5)
3 (d)	The possible reasons for the given project cost overruns (**Minimum 05 reasons**). 1. Unplanned expansion of the project scope. 2. Inaccurate initial cost estimation. 3. Failures in project performance. 4. Errors in project design. 5. Improper risk management. 6. Improper project team building. 7. Wrong choice of equipment. 8. Incompetent material suppliers. 9. Time overrun. (5) **OR** The possible reasons for the given project time overruns (**Minimum 05 reasons**). 1. A change in the scope of the project. 2. Ineffective project time management. 3. Delays in starting and executing some of the project activities. 4. A delay in one project, results in delays in subsequent projects. 5. Use of outdated technology. 6. Political interference.

	7. Poor administration. 8. Poor planning. (5)
Section – IV	
4 (a)	Functions of project planning (**Any four functions**). 1) It should provide a basis for organizing the work on the project. 2) It allocates the responsibilities to individuals. 3) It is a means of communication and co-ordination between all those involved in the project. 4) It induces the people to look ahead. 5) It instills a sense of urgency and time consciousness. 6) It establishes the basis for monitoring and controlling. (4) **OR** Following tools are available for making project planning. 1. Gantt chart 2. Network Techniques 3. Project design 4. Time estimates (4)
4 (b)	The time estimation for completing the project involves the calculation of three time values for each activity of a project and these are: a) Optimistic time (t_o): It is the time required to complete the activity if no hurdles or complications arise. b) Most likely time (t_m): It is the time in which the activity is most likely to be completed by considering the normal circumstances and making allowance for some unforeseen delays. c) Pessimistic time (t_p): It is the time required to complete the activities if unusual complications or unforeseen difficulties arise. (3x2=6) **OR** Situation analysis is a process through which the general characteristics and problems of community are identified. It involves the identification and definition of the characteristics and problems specific to particular categories of people in the community. It is done through collecting information necessary to understand the community as a whole and individuals within the community. Information should be collected on what happened in the past, what is currently happening based on the community's experiences. Information for Situation analysis should be collected with the involvement of the community members using below mentioned techniques: (**any six**) 1. Document's review 2. Surveys

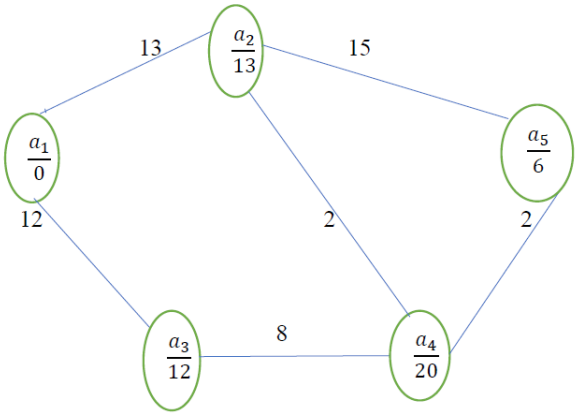
	3. Discussions with individuals, specific groups and the community as a whole 4. Interviews 5. Observations 6. Listening to people; 7. Brainstorming 8. Informal conversations 9. Problem tree (3+3)
4 (c)	A goal is a general statement of what should be done to solve a problem. Objectives are finite sub-set of a goal and should be specific in order to be achievable. The objectives should be "SMART." They should be: **Specific:** clear about what, where, when, and how the situation will be changed **Measurable:** able to quantify the targets and benefits **Achievable:** able to attain the objectives **Realistic:** able to obtain the level of change reflected in the objective; and **Time bound:** stating the time period in which they will each be accomplished. (5) **OR** In a Gantt chart, the activities of project are broken down into a series of well-defined jobs of short duration whose cost and time can be estimated. It is a tool in which the activities or jobs are represented by horizontal bars in the time access. The length of the bar indicates the estimated time for the job. The left end of the bar shows the beginning time and the right end shows the end time. The manpower required for the activity is shown by the number on the bar. The project review dates are indicated by a vertical dotted line and at this time horizontal line is drawn below each bar to indicate the progress actually made up to the date. The length of the progress line is then drawn to represent the percentage of the job that has been completed at the review date. (5)
4 (d)	The objectives and policies are very important while planning the project. If the project team lacks a clear goal even excellence skills and the best equipment will not enable the team to do a good job. Well defined objectives and policies serve as the framework for the decisions to be made by the project manager. The objectives of the project may be technical objective, performance objective, time and cost goals. Policies are the general guide for decision making on individual actions. Some of the policies of the project are, extent of work given to outside contractors, number of contracts to be employed, terms of the contract, etc. (5) **OR** Project evaluation is a step-by-step process of collecting, recording and organizing the information about the project results, short term outputs and long term outputs. Project evaluation provides

	answers to several aspects such as progress made, desired output achieved, improvements to be made for better outcome, whether the results justify the input etc. (5)
Section – V	
5 (a)	Purposes of project control. (Any four) 1. To control the progress of the activities. 2. To control the performance of the project activities. 3. To control the project schedule. 4. To have the control over the project cost. 5. To have control over the delays in project activities. 6. To motivate project personnel through performance evaluation. 7. To achieve the project goals effectively and efficiently. (4) **OR** Objectives of project review (Any four) 1. To examine whether the project is implemented in a specified ways or not. 2. To assess the impact of the project. 3. To examine the project efficiency. 4. To measure the quality of the project. 5. To review the safety aspects followed during the project. 6. To examine the methods, process, procedures followed during the project. 7. To assess the outcome of the project. (4)
5 (b)	The project audit aims to obtain a clear picture of the actual status of the project from time to time. The detailed audit program involves the following steps: **Step 1:** Preliminary examination of the project's organization, administration, record keeping, planning and control and working methods and techniques performed in order to establish project current and future status. **Step 2:** Preparing the statements of project current and future status, giving a detailed list of completed work as compared with the project's performance baseline, recording the cost and quality aspects, record keeping, working methods and communication aspects. **Step 3:** Conducting preliminary analysis and presenting results in the form of audit report. (6) **OR** The performance evaluation is done periodically and it measures the performance of the project on an ongoing basis. The performance evaluation may be done in terms of economic rate of return on investment or book rate of return on investment.

	1) Economic rate of return for a given year = (Cash flow +Changes in present value) / Present value at the beginning of the year 2) Book rate of return for a given year = (Cash flow +Changes in book value) / Book value at the beginning of the year (6)
5 (c)	Critical Path Method (CPM) The Critical Path Method (CPM) is an important tool in production planning and scheduling. CPM is used for scheduling special projects where the relationship between the different parts of project is more complicated than of a simple chain of task to be completed one after the other. A CPM is a route between two or more operations which minimises (or maximises) some measures of performance. Under CPM, the project is analyzed into different operation or activities and their relationship are determined and shown on the network diagram, so, first of all a network diagram is drawn. After this the required Time or some other measure of them combined to develop a schedule which minimizes or maximizes the measure of performance for each operation. Thus, CPM marks critical activities in a project and concentrates on them. (5) **OR** Program Evaluation and Review Technique (PERT) PERT is a time-event network analysis technique designed to watch how the parts of a programme fit together during passage of time and events. The PERT is used for planning and control of large projects in various industries like defence, chemical and construction industries. Under PERT all individual tasks are shown in a network. All the events are shown by circles and whose completion can be measured at a given time. Each arrow represents an activity, which are the time consuming elements of a program. The activity time is the lapsed time required to accomplish an event. Finally, compute the critical path and the slack time. The critical path is a sequence of activities, which takes the longest time to complete the work and the least slack time. (5)
5 (d)	 (5)

OR

activity Numerical Description	Time Estimate			$t_e = \frac{t_o + 4t_m + t_p}{6}$
	t_o	t_m	t_p	
(a) 1 - 2	9	12	21	13
(b) 1 - 3	6	12	18	12
(c) 2 - 4	1	1.5	5	2
(d) 3 - 4	4	8.5	10	8
(e) 2 - 5	10	14	24	15
(f) 4 - 5	1	2	3	2



(2+3=5)

Section – VI

6 (a) A cloud-based project management software coordinates the planning, collaborating, monitoring, and delivering of a project. It allows project managers and teams to get work done using a network of tools available within the software, rather than using a plain old whiteboard and sticky notes. The use of project management software scales from business to business—and team to team. But, in all, it is designed to make managing projects and deadlines easier and more effective. Cloud Technology allows the people to use the digital resources stored in the virtual space by the way of networks, often using satellite network. It allows people to share the information and applications across the internet without being the restriction of their physical location. (5)

OR

Internet of Things (IoT) and sensors are used to get real-time information from various connected devices and predict the outcome. In project management, the IoT technology will fundamentally alter the speed of project execution. Organizations that adopt IoT will complete the projects in a speedy manner. The IoT intersects with project management on everything from team collaboration to data collection and can expect real time status reporting via IoT to user in a new era of dynamic planning and execution. Data collection will happen on a large scale allowing leaders to make more informed decisions. Inventory and resources will be easily monitored at all times. Devices can automatically sense and respond to what is happening around them reducing the need for human intervention, lowering operating costs and increasing response time and minimizing errors. (5)

6 (b) A smart city is a framework, predominantly composed of information and communication technologies (ICT), to develop, deploy and promote sustainable development practices to address a growing urbanization challenges. This ICT framework is essentially an intelligent network of connected objects and machines that transmit the data using wireless technology and the cloud technology. Cloud based IoT applications receive, analyze and manage data in real-time to help

	municipalities, enterprises and citizens to make better decisions that improve quality of life. Augmented Reality (AR) can be the interface which provides access to all the benefits of a smart city. (5) **OR** Digital technologies are electronic tools, systems, devices and resources that generate, store or process data. The effective use of digital learning tools in classrooms can increase student engagement, help teachers improve their lesson plans, and facilitate personalized learning. It also helps students build essential 21st-century skills. Augmented Reality (AR) and Virtual Reality (VR) technologies offer great opportunities and diversity in education including remote learning, interactive learning etc., Students can collaborate on group projects using technology-based tools which enables new ways of learning, communicating, and working collaboratively where learners use programs or applications designed for problem solving or open-ended learning or technology for teachers, such as interactive whiteboards or learning platforms. (5)