**UPES**

## UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
### End Semester Examination, December 2018

**Course:** Project Management & Contract Administration   (CODE: LSCM 8001)   **Semester: III**
**Programme:** MBA (GENERAL- HR/FIN./MKTG)   **Time: 03 hrs.**
**Max. Marks: 100**

### SECTION A
**Instructions: Choose the most appropriate answer. Each question carries 1 mark**   **(1 x 20 = 20 marks)**

| S. No. | | Marks | CO |
|--------|---|-------|-----|
| Q1 | When making contingency estimates, the contractor should<br>    a. estimate the amount to mitigate high impact and probable issues.<br>    b. include an amount for each issue that has high impact.<br>    c. include a small amount for each possible issue.<br>    d. heavily pad the estimates to include every issue. | 1 | CO2 |
| Q2 | Cost-reimbursement contracts are most appropriate for projects that<br>    e. take less than one year to complete.<br>    f. are with customers that want a single payment date.<br>    g. are well defined and entail little risk.<br>    h. involve risk. | 1 | CO5 |
| Q3 | The project scope is all the work that must be done to do all of the following except:<br>    a. meet with every stakeholder.<br>    b. produce all the project deliverables.<br>    c. accomplish the project objective.<br>    d. satisfy the sponsor or customer that all the work and deliverables meet the requirements or acceptance criteria. | 1 | CO2 |
| Q4 | Although major or key deliverables may be stated in the project charter or request for proposal, they need to be_____in the project scope document.<br>    a. repeated<br>    b. expanded on in greater detail<br>    c. stated at higher levels<br>    d. listed in sequence with the responsible person or organization | 1 | CO2 |

| Q5 | A change control system needs to be established to define how<br>  a.  changes will be documented, approved, and communicated.<br>  b.  changes will be made.<br>  c.  the acceptance criteria are evaluated.<br>  d.  the quality plan is applied. | **1** | **CO3** |
|---|---|---|---|
| Q6 | The work packages are at a level where_____can be assigned responsibility and accountability for accomplishing the work package.<br>  a. a single organization or individual<br>  b. multiple organizations or individuals<br>  c. a project manager<br>  d. the project team | **1** | **CO2,CO3** |
| Q7 | In preparing a network diagram, drawing activities in a_____is not acceptable because it portrays a path of activities that perpetually repeats itself.<br>  a. loop<br>  b. ladder<br>  c. list<br>  d. link | **1** | **CO2,CO3** |
| Q8 | The estimated types and quantities of resources required for an activity together with the availability of those resources will influence the<br>  a. estimated duration for how long it will take to perform the activity.<br>  b. project scope document description.<br>  c. project's acceptance criteria.<br>  d. actual costs of work performed. | **1** | **CO2** |
| Q9 | The earliest start time for a specific activity must be_____the latest of all the earliest finish times of all the activities leading directly into that specific activity.<br>  a. earlier than<br>  b. the same as<br>  c. the same as or later than<br>  d. later than | **1** | **CO2** |
| Q10 | Calculate the latest start for Task D if one of its successors, Task F, has a latest start on day 9, its other successor, Task E, has a latest start on day 10, and the duration of Task D is 2 days.<br>  a. day 8<br>  b. day 7<br>  c. day 12<br>  d. Cannot be calculated based upon information given. | **1** | **CO2** |
| Q11 | Value of Schedule Variance (SV) in EVM at the completion of the project will be | **1** | **CO4** |

| | | | |
|---|---|---|---|
| | a. 1 | | |
| | b. 0 | | |
| | c. Greater than 1 | | |
| | d. Less than 1 | | |
| Q12 | Free slack is the amount of time a specific activity can be<br><br>  a. postponed without delaying the earliest start time of its immediately preceding activities.<br><br>  b. postponed without delaying the earliest start time of its immediately succeeding activities.<br><br>  c. accelerated without delaying the latest start time of its immediately succeeding activities.<br><br>  d. accelerated without delaying the latest finish time of its immediately preceding activities. | **1** | **CO2** |
| Q13 | The total completion time is 25 days. Task A is planned to take seven days. Task B is planned to take five days. Task C is planned to take eight days. The tasks have a serial relationship. How much slack does the project have?<br><br>  a. Negative 5 days slack.<br><br>  b. Positive 5 days slack.<br><br>  c. Positive 17 days slack.<br><br>  d. Positive 3 days slack. | **1** | **CO2** |
| Q14 | Crunching involves<br><br>  a. Decrease in direct costs.<br><br>  b. Increase in direct costs.<br><br>  c. Increase or decrease in direct costs depending on the project.<br><br>  d. No change in the direct costs. | **1** | **CO3** |
| Q15 | Consider a project that involves painting five similar houses over ten weeks (one house every two weeks) for a total budgeted cost of $20,000. The budget is $4,000 per house. At of the end of week 5, you determine that $10,000 has actually been spent and three houses have been painted completely. What is the earned value of the project?<br>  a. $10,000<br>  b. $12,000<br>  c. $4,000<br>  d. $20,000 | **1** | **CO4** |
| Q16 | Calculate the forecasted cost at completion (FCAC) if the total budgeted cost is $15,000, the cumulative actual cost is $10,000, and the cumulative earned value is $12,000.<br>  a.     FCAC = $7,000 | **1** | **CO4** |

| | | | |
|---|---|---|---|
| | b.      FCAC = $17,000 | | |
| | c.      FCAC = $13,000 | | |
| | d.      FCAC = $37,000 | | |
| Q17 | Risks ____ should be given higher priority because if the risk occurs, it would have a greater impact on the schedule than if it was associated with activities on a path that has a large positive value of total slack.<br>a.   that occur first in the project<br>b.   that affect the most costly activities<br>c.   on the critical path<br>d.   that affect the activities near the end of the project | 1 | CO2,CO4 |
| Q18 | In the_____stage of team development, work performance accelerates and productivity increases.<br>a. forming<br>b. norming<br>c. storming<br>d. performing | 1 | CO2 |
| Q19 | Team building is the responsibility of<br>a. both the project manager and the project team.<br>b. the project manager.<br>c. the project team.<br>d. the organization's management. | 1 | CO2 |
| Q20 | In the____stage of team development, the project manager concentrates on project performance with respect to the budget, schedule, scope, and plan.<br>a. forming<br>b. norming<br>c. storming<br>d. performing | 1 | CO2,CO4 |
| **SECTION B**<br>**Instructions: Attempt any 4 out of 6 questions. Each question carries 5 marks**          **(4 x 5=20 marks)** |

| | | | |
|---|---|---|---|
| Q1 | Discuss role of  PMO in effective project management. | 5 | CO2 |
| Q2 | Briefly explain different project management knowledge areas as per PMBOK® by PMI, USA. | 5 | CO1,CO2 |
| Q3 | Briefly explain analogous and parametric estimating techniques used for activity duration estimation? | 5 | CO2,CO3 |

| Q4 | Explain Net Present Value (NPV) and Internal Rate of Return method (IRR) of project appraisal. | 5 | CO1 |
|---|---|---|---|
| Q5 | Discuss briefly characteristics of an effective project manager. | 5 | CO2 |
| Q6 | What is single stage and two stage bidding system? | 5 | CO5 |

## SECTION-C

**Instructions: Attempt any 3 out of 5 questions. Each question carries 10 marks        (3 x 10=30 marks)**

**Q1)** Bill Fennema, president of Fennema Constructions, has developed the tasks, durations and predecessor relationships for a new building construction project. From his past work experience, Bill has realised that site work output is unreliable due to number of factors and hence there is uncertainty in duration estimates.

| Activity | Activity Duration Estimate (weeks) | | | Immediate Predecessor |
|---|---|---|---|---|
| | Optimistic Time Estimate | Most Likely Time Estimate | Pessimistic Time Estimate | |
| A | 2 | 4 | 6 | - |
| B | 5 | 8 | 11 | - |
| C | 7 | 9 | 17 | - |
| D | 1 | 2 | 3 | A |
| E | 2 | 4 | 12 | B |
| F | 4 | 4 | 4 | C |
| G | 1 | 1 | 1 | D |
| H | 2 | 2 | 2 | E,F,G |

10    CO2

a) Determine the expected project completion time and those activities that lie along the critical path.
b) Suppose Bill has a personal goal of completing the project in 14 weeks. What is the probability that it will happen this quickly?

| Q2) | Management of your organization has designated you as project manager for installation of new equipment in a manufacturing process at your customer's plant. Customer of the project is a key customer and your top management wants to ensure that project is completed successfully. Since it is a critical project for the customer also, there is a penalty clause included in the contract signed between your organization and the customer. A penalty cost of $10,000 per week will be incurred for every week the project is delayed beyond week 9. Indirect costs are $10,000 per week. The following tables depict the major activities identified by you for completion of the project. | | |
|---|---|---|---|

| Activity | Normal Time (weeks) | Normal Cost ($) | Crash Time (weeks) | Crash Cost ($) | Immediate Predecessor |
|---|---|---|---|---|---|
| A | 3 | 7000 | 2 | 10000 | - |
| B | 1 | 3000 | 1 | 3000 | - |
| C | 4 | 12000 | 2 | 40000 | A |
| D | 2 | 12000 | 1 | 28000 | B |
| E | 1 | 8000 | 1 | 8000 | C |
| F | 4 | 5000 | 2 | 15000 | D,E |
| G | 2 | 9000 | 1 | 18000 | E |

(Q2 marks: **10**, CO: **CO3**)

Generate optimum project schedule (having minimum project cost) using crashing.

| Q3) | Discuss the characteristics, advantages and disadvantages of the functional, matrix and projectized organisational structures for managing projects. | **10** | **CO2, CO4** |
|---|---|---|---|

| Q4) | Discuss different strategies for managing positive and negative risks in a project. | **10** | **CO2,CO4** |
|---|---|---|---|

| Q5) | What are fixed price and cost reimbursable contracts. Discuss different types of cost reimbursable contracts. | 10 | CO5 |
|---|---|---|---|

**SECTION-D**

**Instructions:** **(30 marks)**

Q RusTech Tooling Inc. is a large job shop operation that builds machine tools and dies to manufacture parts for specialized items. The company is bidding a contract to produce parts for military aircraft weapon system for a defense equipment manufacturing organization. A major criterion for selecting the winning bid besides low cost is time required to produce the part. If awarded the contract, the company needs closely monitor both time and cost performance of the project. In order to determine the project completion time and cash flow requirements, the company has identified the major work packages alongwith other information. Same is given in the following tables i.e. details of tasks of a project, their duration, dependency, cost and cost distribution. All cost figures are in thousand of rupees.

| Work Package | Duration (in weeks) | Predecessor | Budgeted Cost (Rs 000' s) |
|---|---|---|---|
| A | 2 | - | 4 |
| B | 5 | A | 15 |
| C | 6 | A | 24 |
| D | 3 | B | 9 |
| E | 4 | C | 16 |
| F | 3 | D,E | 6 |

30    CO2,CO4

Progress at the end of Week 4 for the above project is as follows:

- Task A complete. Actual Cost Rs 3,000.
- Task B 50 % complete. Actual cost Rs 10,000.
- Task C 33 % complete. Actual cost Rs 8,000.

**Answer the following questions**

| | | | |
|---|---|---|---|
| | a) Develop PDM network diagram and find project completion time with CPM analysis.<br>b) Draw Gantt chart and set up project cost baseline (*Cost Distribution for each task/ work package can be done on prorata basis*).<br>c) Calculate PV, EV, CV, SV, CPI and SPI of the project as on reporting date i.e. end of week 4.<br>d) Calculate estimated cost at completion (EAC) and estimate time of completion.<br>e) Give your comment on the health of the project. | | |

**Note: - Pl. start your question paper from next page**

| Name: | |
|---|---|
| Enrolment No: | **UPES** |

<div align="center">

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**
**End Semester Examination, December 2018**

</div>

**Course:** Project Management & Contract Administration   (CODE: LSCM 8001)     **Semester: III**
**Programme:** Masters in Business Administration (GENERAL- HR/FIN./MKTG)     **Time: 03 hrs.**
**Max. Marks: 100**

<div align="center">

**SECTION A**

</div>

**Instructions:**

| S. No. | | Marks | CO |
|---|---|---|---|
| Q 1 | A vehicle for establishing good customer–contractor communications and arriving at a mutual understanding and clear expectations to ensure project success is<br>   a.  a request for proposal.<br>   b.  a contract.<br>   c.  a communication plan.<br>   d.  the initiation phase of a project. | **1** | **CO5** |
| Q2 | The type of contract where the customer and the contractor agree on a price for the proposed work is<br>   a. a fixed price contract<br>   b. a fixed agreement.<br>   c. a cost reimbursement contract.<br>   d. a work agreement. | **1** | **CO5** |
| Q3 | Fixed-price contracts are most appropriate for projects that<br>   a.  take less than one year to complete.<br>   b.  are with customers that want a single payment date.<br>   c.  are well defined and entail little risk.<br>   d.  involve risk. | **1** | **CO5** |
| Q4 | In a_____, the customer agrees to pay the contractor for all actual costs (labor, materials, and so forth), regardless of amount, plus some agreed-upon profit.<br>   a.  fixed price contract | **1** | **CO5** |

| | | | |
|---|---|---|---|
| | b. fixed agreement | | |
| | c. cost reimbursement contract | | |
| | d. work agreement | | |
| Q5 | The project scope document is valuable for establishing<br>    a.    a request for proposal for the project.<br>    b.    a common understanding among project stakeholders regarding the scope of the<br>        project.<br>    c.    the contact between the contractor and the customer.<br>    d.    the risk management plan for the project. | 1 | CO2 |
| Q6 | The WBS establishes the framework for<br>    a. developing the acceptance criteria.<br>    b. further planning to create a baseline plan for performing the project work.<br>    c. listing the deliverables.<br>    d. defining the major tasks or work elements. | 1 | CO2 |
| Q7 | Once the project scope document has been prepared and agreed on, the next step in the planning phase is to<br>    a.  monitor and control the quality to assure acceptance.<br>    b.  create a detailed work breakdown structure.<br>    c.  begin work on the project.<br>    d.  prepare and approve the contract. | 1 | CO2 |
| Q8 | At the completion of a project<br>    a.  SV is 0<br>    b.  Both SV and CV are 0<br>    c.  SV=CV<br>    d.  CV=0 | 1 | CO4 |
| Q9 | A_____shows their appropriate sequence and defines the dependent relationships indicating how the activities need to be performed to accomplish the overall project work scope and produce the deliverables.<br>    a.  responsibility assignment matrix<br>    b.  network diagram<br>    c.  work breakdown structure<br>    d.  project scope document | 1 | CO2 |
| Q10 | Desirable value of CPI in EVM<br>    a.  less than 1<br>    b.  greater than 1<br>    c.  equal to 1<br>    d.  0 | 1 | CO4 |
| Q11 | It is important to know what types of resources are available, in what quantities, and during what time periods to determine<br>    a.  that the project team will be larger than necessary to complete the project.<br>    b.  how to enter resources into a project management information system. | 1 | CO2,CO3 |

| | | | |
|---|---|---|---|
| | c. if the right types of resources will be available in sufficient quantities during the time periods that the project requires.<br><br>d. that the project will be less expensive than estimated. | | |
| Q12 | Earliest finish time (EF) is the earliest time by which a specific activity can be completed, calculated<br><br>a. by subtracting the activity's estimated duration from the earliest finish time of the activity's predecessor: EF = EF predecessor - Estimated Duration.<br><br>b. by subtracting the activity's estimated duration to the activity's earliest start time: EF = ES • Estimated Duration.<br><br>c. by adding the activity's estimated duration to the earliest start time of the activity's succeeding activity: EF = ES succeeding activity + Estimated Duration.<br><br>d. by adding the activity's estimated duration to the activity's earliest start time: EF = ES + Estimated Duration. | **1** | **CO2** |
| Q13 | Calculate the earliest start for Task B if its predecessor, Task A, finishes on day 3 and the duration of Task B is 2 days.<br><br>a. day 5<br><br>b. day 3<br><br>c. day 1<br><br>d. Cannot be calculated based upon information given. | **1** | **CO2** |
| Q14 | Total slack is calculated for each of the activities by finding the difference between<br><br>a. the ES of the activity and the LF of the activity or the difference between the EF and LS of the activity.<br><br>b. the EF of the activity and the LS of the activity or the difference between the ES and LF of the activity.<br><br>c. the EF of the activity and the LF of the activity or the difference between the ES and LS of the activity.<br><br>d. the ES of the activity and the LF of the activity or the difference between the ES and LF of the activity. | **1** | **CO2** |
| Q15 | Activities can be delayed only to the point where all their positive slack is used up, as any further delays would cause the project to<br><br>a. increase costs of all the activities in the project.<br><br>b. extend beyond the project completion time. | **1** | **CO2** |

| | | | |
|---|---|---|---|
| | c. be completed ahead of schedule.<br>d. increase its requirements for additional resources for all activities. | | |
| Q16 | When several activities need the same limited resource at the same time, the activities with<br>a. the least slack have first priority.<br>b. the longest duration have first priority.<br>c. the near term have first priority.<br>d. use the most resources have first priority. | **1** | **CO2,CO3** |
| Q17 | In EVM, if the cumulative earned value is greater than the cumulative actual costs, then<br>a. the cost performance index (CPI) is greater than 1.0.<br>b. the CPI is less than 1.0.<br>c. CPI cannot be determined with CEV and CAC.<br>d. the CPI is negative. | **1** | **CO4** |
| Q18 | In the_____stage of team development, the project manager minimizes directiveness and takes on a more supportive role.<br>a. forming<br>b. norming<br>c. storming<br>d. performing | **1** | **CO2,CO4** |
| Q19 | In the_____stage of team development, the project manager acts as a mentor, supporting the professional growth and development of the people.<br>a. forming<br>b. norming<br>c. storming<br>d. performing | **1** | **CO2,CO4** |
| Q20 | Total slack for the project is the difference between<br>a. LF time of last activity and the project required completion time.<br>b. EF time of last activity and the project required completion time.<br>c. ES time of last activity and the project required completion time.<br>d. LS time of last activity and the project required completion time. | **1** | **CO2** |

**SECTION B**
**Instructions: Attempt any 4 out of 6 questions. Each question carries 5 marks          (4 x 5 = 20 marks)**

| Q1) | Explain briefly steps of risk management in projects. | **5** | **CO2,CO4** |
|---|---|---|---|

| Q2) | Explain shifting, stretching, splitting of project activities used for resource levelling. | 5 | CO2 |
|---|---|---|---|
| Q3) | What are advantages and disadvantages of a projectised organization structure for implementing projects. | 5 | CO2,CO4 |
| Q4) | Explain control accounts. | 5 | CO4 |
| Q5) | Briefly explain commonly used tender documents in procurement. | 5 | CO5 |
| Q6) | Explain different project management process groups as per PMBOK® by PMI, USA. | 5 | CO1,CO2, CO4 |

### SECTION-C
**Instructions: Attempt any 3 out of 5 questions. Each question carries 10 marks          (3 x 10=30 marks)**

**Q1)** Information concerning a product design project is given in the following table. Indirect project cost amount to $250 per day. The company will incur a $100 per day penalty for each day the project lasts beyond day 14.

| Activity | Predecessor | Activity Cost ($) | | Activity Duration (days) | |
|---|---|---|---|---|---|
| | | *Normal* | *Crash* | *Normal* | *Crash* |
| A | - | 1000 | 1200 | 5 | 4 |
| B | - | 800 | 2000 | 5 | 3 |
| C | A,B | 600 | 900 | 2 | 1 |
| D | B | 1500 | 2000 | 3 | 2 |
| E | C,D | 900 | 1200 | 5 | 3 |
| F | E | 1300 | 1400 | 2 | 1 |
| G | E | 900 | 900 | 3 | 3 |
| H | G | 500 | 900 | 5 | 3 |

Using crashing to generate optimum project schedule.

(10, CO3)

| Q2) | To complete a construction project, a project manager has laid out the eight major activities involved in the project. These activities have been labeled A through H in the following table, which also shows completion times (in weeks) and immediate predecessors. | | |
|---|---|---|---|

| Activity | Predecessor | Pessimistic Time Estimate | Most Likely Time Estimate | Optimistic Time Estimate |
|---|---|---|---|---|
| A | - | 7 | 5 | 2 |
| B | A | 5 | 3 | 2 |
| C | B | 14 | 8 | 6 |
| D | B | 20 | 10 | 6 |
| E | B | 8 | 3 | 3 |
| F | C,D | 10 | 5 | 3 |
| G | D | 12 | 6 | 4 |
| H | E,G | 16 | 6 | 5 |

a) How long the project likely to take for completion.
b) Determine time to complete the project with a probability of 95%.

(Q2 marks: **10**, **CO2**)

| Q3) | Differentiate between top and bottom down estimation techniques. Discuss commonly used cost estimation techniques for estimating activity cost estimate. | **10** | **CO2** |
|---|---|---|---|
| Q4) | Discuss various stages of project team development and their characteristics. | **10** | **CO2** |
| Q5) | Discuss different facets of project feasibility analysis. Differentiate discounted cash flow techniques of Net Present Value (NPV) method and Internal Rate of Return method (IRR) used for project appraisal. | **10** | **CO1** |

**SECTION-D**

**Instructions:** **(30 marks)**

| Q | The Horizon Aircraft Company is preparing a contract proposal to submit to the Global Airlines Company for a new commercial aircraft, the JK60. A major criterion for selecting the winning bid besides low cost is time required to produce the first aircraft. If awarded the contract, the company needs closely monitor both time and cost performance of the project. Part of the bid proposal is a development and production schedule for the completion of first aircraft. In order to determine the project completion time and cash flow requirements, the project manager has identified the major work packages alongwith time and cost information. Same is given in the following tables i.e. details of tasks of a project, their duration, dependency, cost and cost distribution. All cost figures are in thousand of rupees. | 30 | CO2, CO4 |
|---|---|---|---|

| Work Package | Duration | Budgeted Cost | Predecessors | Actual Cost Incurred at end of period 6 | Physical Progress at end of Period 6 (% complete) |
|---|---|---|---|---|---|
| A | 2 | 20 |  | 30 | 100% |
| B | 2 | 15 | A | 20 | 100% |
| C | 4 | 100 | A | 110 | 60% |
| D | 3 | 35 | A | 60 | 80% |
| E | 3 | 120 | C,D | 0 | 0% |
| F | 2 | 30 | E | 0 | 0% |

| Schedule Information | | | Baseline Budget Needs | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Time Period in months | | | | | | | | | | |
| Work Package | Duration | Budgeted Cost | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| A | 2 | 20 | 10 | 10 | | | | | | | | | |
| B | 2 | 15 | | | 5 | 10 | | | | | | | |
| C | 4 | 100 | | | 20 | 30 | 30 | 20 | | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **D** | 3 | 35 | | | 15 | 10 | 10 | | | | | | |
| **E** | 3 | 120 | | | | | | | 30 | 40 | 50 | | |
| **F** | 2 | 30 | | | | | | | | | | 10 | 20 |

**Answer the following questions**

a) Develop PDM network diagram and find project completion time with CPM analysis.
b) Set up project cost baseline
c) Calculate PV, EV, CV, SV, CPI and SPI of the project as on end of period 6.
d) Forecast the estimated cost at completion (EAC) and also estimated time of the completion of the project.
e) Give your comment on the health of the project as on reporting date.