# UNIVERSITI TUN HUSSEIN ONN MALAYSIA

## PEPERIKSAAN AKHIR
## SEMESTER II
## SESI 2008/2009

| | | |
|---|---|---|
| NAMA MATA PELAJARAN | : | PERANCANGAN, PENJADUALAN DAN PEMBINAAN |
| KOD MATA PELAJARAN | : | BFP 4013 |
| KURSUS | : | 4 BFF |
| TARIKH PEPERIKSAAN | : | APRIL 2009 |
| JANGKA MASA | : | 3 JAM |
| ARAHAN | : | JAWAB **EMPAT (4)** DARIPADA LIMA SOALAN SAHAJA. |

**Q1** Management is the process of planning and decision making, organizing, leading and controlling and organization.

(a) Explain the **three (3)** basic management activities.

(6 marks)

(b) State **five (5)** elements of project controlling.

(5 marks)

(c) Give the definition for the terms used in Earned Value Approach below:
   (i.) Budgeted Cost of Work Schedule.
   (ii.) Budgeted Cost of Work Performed.
   (iii.) Actual Cost of Work Performed.

(3 marks)

(d) Explain the **four (4)** stages of Quality Management according to BS EN ISO 8402.

(8 marks)

(e) State **three (3)** procedures in Human Resources Planning

(3 marks)

**Q2** **Table Q2** shows list of activities ID involved in a single storey house construction at Kampung Budaya, Batu Pahat. Based on the information given:

(a) Develop a Precedence Diagram Method (PDM) for this project.

(7 marks)

(b) Determine the total project duration and list out the activity involve in critical path.

(2 marks)

(c) Calculate the total float for each activity.

(6 marks)

(d) Draw a bar chart of the project according to early start and show the lag position.

(10 marks)

**Q3**    **Table Q3** shows list of activities involved in hostel construction at Universiti Tun Hussein Onn Malaysia. Based on the information given:

(a)    Develop a network diagram based on activity using Arrow Technique Diagram and calculate the event time.

(2 marks)

(b)    Determine the total project duration and list out the activity involve in critical path.

(3 marks)

(c)    Calculate early start (ES), early finish (EF), late start (LS), late finish (LF) and total float (TF).

(5 marks)

(d)    Draw a bar chart of the project according to early start and show total float.

(5 marks)

(e)    Sketch a histogram of resources for each duration.

(5 marks)

(f)    Do a resource leveling of the project.

(5 marks)

**Q4**    In a construction project, it has been known that the critical path includes five (5) activities. Their durations are tabulated in **Table Q4(a)**.

(a)    Develop Arrow Technique Diagram for this project and determine the total duration for minimum and maximum time.

(4 marks)

(b)    Calculate the value of $T_E, V_R, \sigma_E$

(6 marks)

(c)    According to **Table Q4(b)**, determine the probability that the project will finish by the end of day 31 and sketch the probability diagram.

(5 marks)

(d)    Determine the probability that the project will finish by the end of day 33 and sketch the probability diagram.

(5 marks)

(e)    The completion date with at least 80% confidence level and sketch the probability diagram.

(5 marks)

Q5    Crashing program is a method to reduce construction time with using the optimum cost. The planning data before and after the crashing program are stated as in **Table Q5.**

(a) Develop Precedence Diagram Method and determine the normal project duration based on data given in **Table Q5.**

(5 marks)

(b) Calculate the cost slope for each activity.

(5 marks)

(c) Prepare a table which shows crashing program and sketch each step of crashing for each activity in Precedence Diagram Method.

(12 marks)

(d) Sketch the crashing result showing relationship between duration and cost.

(3 marks)

# FINAL EXAM

| | | | |
|---|---|---|---|
| SEMESTER/SESSION | : SEMESTER II 2008/2009 | COURSE | : 4 BFF |
| SUBJECT | : PLANNING, SCHEDULING AND CONSTRUCTION | CODE OF SUBJECT | : BFP 4013 |

**Table Q2**: List of activities ID involved in a single storey house construction at Kampung Budaya, Batu Pahat

| No | Activity ID | Duration (day) | Predecessor | Relationship | Lag (Day) |
|---|---|---|---|---|---|
| 1 | A | 2 | - | - | 0 |
| 2 | B | 4 | A | Start – Start | 0 |
| 3 | C | 3 | B | Finish - Start | 0 |
| 4 | D | 5 | B | Finish - Start | 0 |
| 5 | E | 7 | A | Finish – Start | 0 |
| 6 | F | 3 | D | Finish – Start | 0 |
| | | | C | Finish - Start | 0 |
| 7 | G | 4 | C | Finish – Start | 0 |
| 8 | H | 2 | E | Finish - Start | 0 |
| 9 | I | 3 | H | Finish - Start | 2 |
| 10 | J | 8 | H | Finish – Start | 0 |
| | | | F | Finish – Start | 0 |
| 11 | K | 2 | G | Finish - Start | 0 |
| 12 | L | 2 | K | Finish - Start | 1 |

**Table Q3**: List of activities involved in hostel construction at Universiti Tun Hussein Onn Malaysia.

| Activity | Predecessor | Duration (day) | Labour (man/day) |
|---|---|---|---|
| A | - | 2 | 4 |
| B | - | 3 | 4 |
| C | A | 2 | 3 |
| D | B | 4 | 6 |
| E | B | 3 | 4 |
| F | C | 1 | 2 |
| G | C,D | 1 | 4 |
| H | F | 2 | 2 |
| I | E | 1 | 5 |
| J | H,G | 2 | 4 |

# FINAL EXAM

**Table Q4(a):** List of activity for a construction project

| Activity | Duration (days) | | |
|:---:|:---:|:---:|:---:|
| | Optimistic | Most Likely | Pessimistic |
| A | 3 | 5 | 6 |
| B | 2 | 3 | 10 |
| C | 2 | 8 | 12 |
| D | 4 | 5 | 7 |
| E | 5 | 8 | 17 |

# FINAL EXAM

**Table Q4(b):** Normal Distribution

# Normal Distribution Function Table



CUMULATIVE PROBABILITIES OF THE NORMAL DISTRIBUTION (AREAS UNDER THE STANDARDIZED NORMALIZED CURVE FROM ∞ TO z)
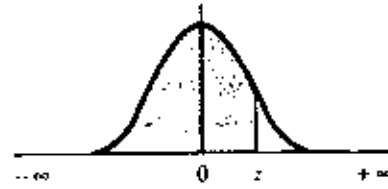
| z | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 |
|---|------|------|------|------|------|------|------|------|------|------|
| 0.0 | 0.5000 | 0.5040 | 0.5080 | 0.5120 | 0.5160 | 0.5199 | 0.5239 | 0.5279 | 0.5319 | 0.5359 |
| 0.1 | 0.5389 | 0.5438 | 0.5478 | 0.5517 | 0.5557 | 0.5596 | 0.5636 | 0.5675 | 0.5714 | 0.5753 |
| 0.2 | 0.5793 | 0.5832 | 0.5871 | 0.5910 | 0.5948 | 0.5987 | 0.6026 | 0.6064 | 0.6103 | 0.6141 |
| 0.3 | 0.6179 | 0.6217 | 0.6255 | 0.6293 | 0.6331 | 0.6368 | 0.6406 | 0.6443 | 0.6480 | 0.6517 |
| 0.4 | 0.6554 | 0.6591 | 0.6628 | 0.6664 | 0.6700 | 0.6736 | 0.6772 | 0.6808 | 0.6844 | 0.6879 |
| 0.5 | 0.6915 | 0.6950 | 0.6985 | 0.7019 | 0.7054 | 0.7088 | 0.7123 | 0.7157 | 0.7190 | 0.7224 |
| 0.6 | 0.7257 | 0.7291 | 0.7324 | 0.7357 | 0.7389 | 0.7422 | 0.7454 | 0.7486 | 0.7517 | 0.7549 |
| 0.7 | 0.7580 | 0.7611 | 0.7642 | 0.7673 | 0.7704 | 0.7734 | 0.7764 | 0.7794 | 0.7823 | 0.7852 |
| 0.8 | 0.7881 | 0.7910 | 0.7939 | 0.7967 | 0.7995 | 0.8023 | 0.8051 | 0.8078 | 0.8106 | 0.8133 |
| 0.9 | 0.8159 | 0.8186 | 0.8212 | 0.8238 | 0.8264 | 0.8289 | 0.8315 | 0.8340 | 0.8365 | 0.8389 |
| 1.0 | 0.8413 | 0.8438 | 0.8461 | 0.8485 | 0.8508 | 0.8531 | 0.8554 | 0.8577 | 0.8599 | 0.8621 |
| 1.1 | 0.8643 | 0.8665 | 0.8686 | 0.8708 | 0.8729 | 0.8749 | 0.8770 | 0.8790 | 0.8810 | 0.8830 |
| 1.2 | 0.8849 | 0.8869 | 0.8888 | 0.8907 | 0.8925 | 0.8944 | 0.8962 | 0.8980 | 0.8997 | 0.9015 |
| 1.3 | 0.9032 | 0.9049 | 0.9066 | 0.9082 | 0.9099 | 0.9115 | 0.9131 | 0.9147 | 0.9162 | 0.9177 |
| 1.4 | 0.9192 | 0.9207 | 0.9222 | 0.9236 | 0.9251 | 0.9265 | 0.9279 | 0.9292 | 0.9306 | 0.9319 |
| 1.5 | 0.9332 | 0.9345 | 0.9357 | 0.9370 | 0.9382 | 0.9394 | 0.9406 | 0.9418 | 0.9429 | 0.9441 |
| 1.6 | 0.9452 | 0.9463 | 0.9474 | 0.9484 | 0.9495 | 0.9505 | 0.9515 | 0.9525 | 0.9535 | 0.9545 |
| 1.7 | 0.9554 | 0.9564 | 0.9573 | 0.9582 | 0.9591 | 0.9599 | 0.9608 | 0.9616 | 0.9625 | 0.9633 |
| 1.8 | 0.9641 | 0.9649 | 0.9656 | 0.9664 | 0.9671 | 0.9678 | 0.9686 | 0.9693 | 0.9699 | 0.9706 |
| 1.9 | 0.9713 | 0.9719 | 0.9726 | 0.9732 | 0.9738 | 0.9744 | 0.9750 | 0.9756 | 0.9761 | 0.9767 |
| 2.0 | 0.9772 | 0.9778 | 0.9783 | 0.9788 | 0.9793 | 0.9798 | 0.9803 | 0.9808 | 0.9812 | 0.9817 |
| 2.1 | 0.9821 | 0.9826 | 0.9830 | 0.9834 | 0.9838 | 0.9842 | 0.9846 | 0.9850 | 0.9854 | 0.9857 |
| 2.2 | 0.9861 | 0.9864 | 0.9868 | 0.9871 | 0.9875 | 0.9878 | 0.9881 | 0.9884 | 0.9887 | 0.9890 |
| 2.3 | 0.9893 | 0.9896 | 0.9898 | 0.9901 | 0.9904 | 0.9906 | 0.9909 | 0.9911 | 0.9913 | 0.9916 |
| 2.4 | 0.9918 | 0.9920 | 0.9922 | 0.9925 | 0.9927 | 0.9929 | 0.9931 | 0.9932 | 0.9934 | 0.9936 |
| 2.5 | 0.9938 | 0.9940 | 0.9941 | 0.9943 | 0.9945 | 0.9946 | 0.9948 | 0.9949 | 0.9951 | 0.9952 |
| 2.6 | 0.9953 | 0.9955 | 0.9956 | 0.9957 | 0.9959 | 0.9960 | 0.9961 | 0.9962 | 0.9963 | 0.9964 |
| 2.7 | 0.9965 | 0.9966 | 0.9967 | 0.9968 | 0.9969 | 0.9970 | 0.9971 | 0.9972 | 0.9973 | 0.9974 |
| 2.8 | 0.9974 | 0.9975 | 0.9976 | 0.9977 | 0.9977 | 0.9978 | 0.9979 | 0.9979 | 0.9980 | 0.9981 |
| 2.9 | 0.9981 | 0.9982 | 0.9982 | 0.9983 | 0.9984 | 0.9984 | 0.9985 | 0.9985 | 0.9986 | 0.9986 |
| 3.0 | 0.9987 | 0.9987 | 0.9987 | 0.9988 | 0.9988 | 0.9989 | 0.9989 | 0.9989 | 0.9990 | 0.9990 |
| 3.1 | 0.9990 | 0.9991 | 0.9991 | 0.9991 | 0.9992 | 0.9992 | 0.9992 | 0.9992 | 0.9993 | 0.9993 |
| 3.2 | 0.9993 | 0.9993 | 0.9994 | 0.9994 | 0.9994 | 0.9994 | 0.9994 | 0.9995 | 0.9995 | 0.9995 |
| 3.3 | 0.9995 | 0.9995 | 0.9995 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9997 |

# FINAL EXAM

**Table Q5:** Data list before and after crashing program

| Activity | Predecessor | Normal Duration (days) | Crash Duration (days) | Normal Cost (RM) | Crash Cost (RM) |
|---|---|---|---|---|---|
| A | - | 2 | 1 | 200 | 250 |
| B | - | 3 | 2 | 300 | 420 |
| C | A | 2 | 1 | 200 | 260 |
| D | C | 2 | 1 | 400 | 480 |
| E | C,B | 4 | 2 | 600 | 680 |
| F | D,E | 3 | 2 | 200 | 350 |