



UNIVERSITI KUALA LUMPUR
INSTITUTE OF MEDICAL SCIENCE TECHNOLOGY

FINAL EXAMINATION
OCTOBER 2025 SEMESTER

COURSE CODE : HRB30103
COURSE TITLE : HUMAN FACTOR & ERGONOMIC
PROGRAMME NAME : BACHELOR OF OCCUPATIONAL SAFETY & HEALTH (HONOURS)
DATE : 31 JANUARY 2026
TIME : 9:00AM - 12:00PM
DURATION : 3 HOURS



INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. This question paper consist of ONE sections.
4. Section A consist of five questions. Answer FOUR (4) questions only.
5. Please write your answer on the answer booklet provided.
6. Please answer all questions in English only.
7. Refer to the attached Formula/ Appendies. Tick if applicable

THERE ARE 13 PAGES OF QUESTIONS INCLUDING THIS PAGE

SECTION A (Total: 100 marks)

Answer FOUR (4) questions.

Please use the answer booklet provided.

Question 1

EverAfter Moments Sdn Bhd, is a wedding event management company with approximately 300 employees located in Klang Valley. The company received surge in bookings, hence forced the company to implement rapid rescheduling and coordination strategy, often managing multiple wedding events on the same weekend. Ms. Nadia, aged 35, joined EverAfter Moments Sdn Bhd as the operations manager given her extensive experience in coordinating high-profile weddings. She is responsible for planning, organising, and executing wedding events from the initial consultation stage until post-event completion. The process includes client consultation and planning, budgeting and contract management, vendor and supplier coordination, event décor management, and on-site event coordination.

The company accepted wedding projects without prior consultation with Ms. Nadia. The peak wedding season schedule required her team to manage up to four weddings per weekend, in addition to weekday client meetings and planning sessions. To meet client expectations and tight timelines, Ms. Nadia and her team frequently worked from 9:00 am until midnight, especially during peak weeks, with only one rest day per week. In addition to her work responsibilities, Ms. Nadia is a mother of two young children. The irregular working hours, frequent weekend events, and last-minute client requests made it increasingly difficult for her to balance work and family life. She often missed family commitments and experienced ongoing conflicts with her spouse regarding childcare and household responsibilities.

One Friday morning, Ms. Nadia received multiple urgent messages from a bride who requested last-minute changes to the wedding programme and décor due to family disagreements. At the same time, the company director Mr. Ezy informed her that several junior staff had expressed dissatisfaction, stating that Ms. Nadia appeared short-tempered, dismissive, and unapproachable during recent wedding events.

Based on the case study, answer the following:

- (a) Discuss the workplace psychosocial hazards concept.

(2 marks)

- (b) Identify **TWO (2)** workplace psychosocial hazards perceived by Ms. Nadia.
(4 marks)

- (c) Based on your answer in (b), assess the job strain perceived by Ms. Nadia according to Karasek's Job Demand–Control (JDC) model.
(4 marks)

- (d) Point out **TWO (2)** adverse effects related to your answer in (b).
(4 marks)

- (e) Select **ONE (1)** instrument used in Malaysia to assess workplace psychosocial hazards and discuss its application in an organization.
(6 marks)

- (f) Identify **ONE (1)** proactive action that Ms. Nadia can take to reduce the psychosocial hazards she experiences at work.
(2 marks)

- (g) Outline **ONE (1)** initiative that can be taken by organization to address workplace psychosocial hazards identified in (b).
(3 marks)

Question 2

Ergonomics play an important role in workplace occupational health and safety.

- (a) Describe ergonomic concept.

(2 marks)

- (b) Point out **TWO (2)** objectives of conducting ergonomics risk assessment at workplace.

(4 marks)

- (c) Determine **TWO (2)** benefits of ergonomics risk assessment to employer.

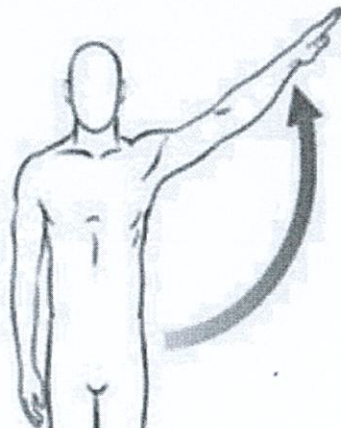
(4 marks)

- (d) Illustrate the process of planning and conducting the Ergonomics Risk Assessment (ERA) as recommended by Department of Occupational Safety and Health.

(7 marks)

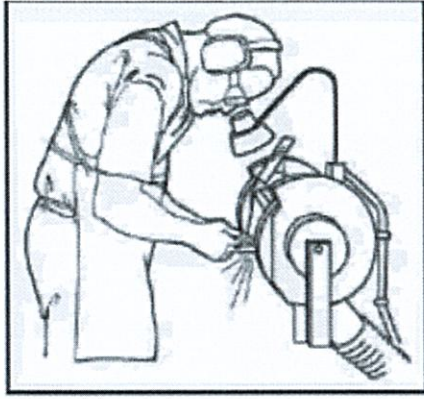
- (e) Identify the following postures:

i.



(2 marks)

ii.



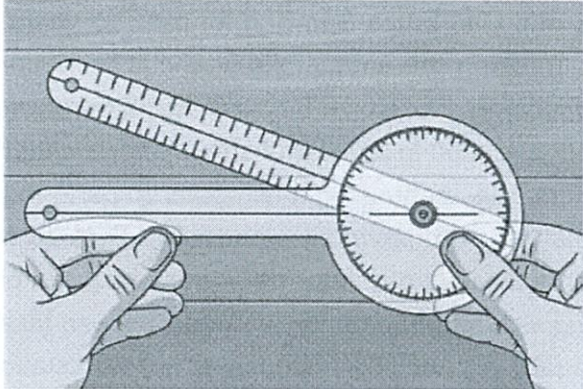
(2 marks)

iii.



(2 marks)

- (f) Name this instrument and its function.



(2 marks)

Question 3

Madam Kwan, 50-year-old, finance clerk with Cari Emas Sdn Bhd for over 15 years. Her role primarily involves managing and overseeing the company's financial operations to ensure accuracy, compliance, and timely reporting. She works 8 hours/ day, 6 days/week, in a demanding environment that requires her attention to detail and time management. Most of her workdays, approximately seven hours, are spent using a computer to perform tasks such as invoicing, collection, financial analysis, and payment processing. Outside of her computer-based tasks, she dedicates approximately one hour daily answering the phone calls, attending meetings, and coordinating with interdepartmental. Madam Kwan takes an hour-long lunch break, in between she usually will work continuously at her workstation for more than 4 hours. She collaborates closely with two co-workers to fulfill departmental responsibilities effectively. Information on her workstation setting is illustrated in Box 1.

Box 1

1. Chair height: too low, non-adjustable
2. Pan depth: more than 3" of space behind the knee, non-adjustable
3. Armrest: too low, arms unsupported, too wide, non-adjustable
4. Back support: working leaning forward, back rest not adjustable
5. Monitor: top of screen is above eye level, too far, neck twist greater than 30°, glare on screen,
6. Telephone: too far for reach, neck and shoulder hold, no hands-free options
7. Mouse: In line with shoulder, pinch grip on mouse, no palm rest
8. Keyboard: wrists extended more than 15°, deviation while typing, too high, platform nonadjustable
9. No adequate foot support
10. Insufficient space to move feet under the table
11. No document holder

Based on the information given, answer the following questions:

- (a) Determine the ergonomic risk assessment instrument used to assess the risk factors.
(2 marks)
- (b) Based on your answer in (a), assess the risk factors.
(10 marks)
- (c) Relate between risk factors identified in (b) and the presence of work-related musculoskeletal disorders (WRMSDs).
(5 marks)

- (d) Identify **ONE (1)** example of WRMSDs that may encounter by Madam Kwan following to risk exposure in (b).

(1 marks)

- (e) Based on risk factors identified in (b), determine **TWO (2)** control measures for improvement.

(4 marks)

- (f) You're instructed to design a standing workstation. Using the information in Box 2, calculate suitable dimensions for a standing workstation.

Box 2

- Stature: Mean 162.9cm, SD: 6.4cm
- Shoulder height: Mean 133.4cm, SD: 5.7cm
- Elbow height: Mean 99.8cm, SD: 4.5cm

(3 marks)

Question 4

Commercial kitchens are known for a complex work environment, where the workers are subjected to many work-related hazards. A cross-sectional study was conducted among 180 kitchen workers. Of these, 50 of them are cooks with average age of 30 years had been in the current position for less than two (2) years. The cooks unable to go for physical activities (Eg: jogging, gym) due to long working hours, and it affected their weight adversely. The workers worked 6 days/ week, 8 hours/day and were allowed to take two (2) breaks not more than 2 hours including 1 hour for lunch. Summary of frequency of symptoms based on anatomical body site for cooks is shown in table below.

NOTE: The graphic is for illustration only. Please read information given to assist your understanding.

Refer Below - Figure1 : Cooking task . Table1 : Frequency of symptoms based on anatomical body site for cooks .

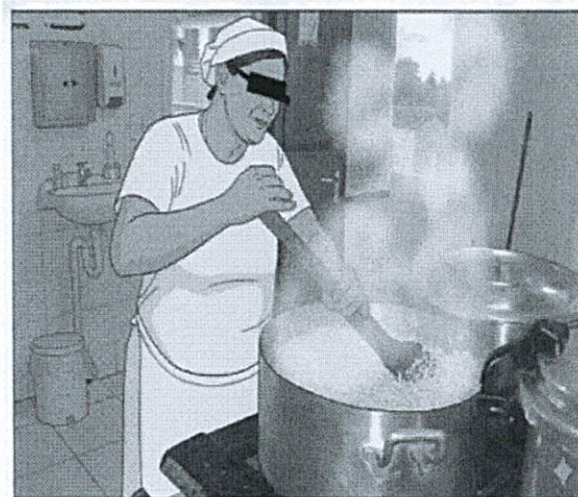


Figure 1: Cooking task

Table 1: Frequency of symptoms based on anatomical body site for cooks

| Body Region | Workers with Symptoms (n) |
|--------------|---------------------------|
| Neck | 24 |
| Shoulders | 31 |
| Elbows | 18 |
| Wrists/Hands | 37 |
| Upper Back | 42 |
| Lower Back | 45 |
| Hips/Thighs | 21 |
| Knees | 36 |
| Ankles/Feet | 29 |

- (a) Identify the instrument used to assess symptoms of work-related musculoskeletal disorders (WRMSDs). Next, calculate the most prevalent body site of WRMSDs for the cooks.

(4 marks)

- (b) Based on information box 3 and box 4, identify **TWO (2)** possible ergonomic hazards.

Box 3 Findings of 1 hour observation involving 20% of the cooks

- The head and neck were bending for more than half of the time.
- The body was bent forward, for more than half of the time.
- Both arms were raised away from the body more than half of the time.
- Regular arm movement is estimated to be between 11 to 15 times per minute with some pauses for both arms.
- The right wrist was bent more than half of the time. Left wrist was bent part of time.
- Moderate force was applied almost all the time cooking.
- Cooks power gripping of ladle with some effort using both hands.
- Cooks worked 8 hours of cooking every day, estimated 3 to 4 hours of continuous work.

Box 4 Summary of interview sessions

- The cooks complained often that it is difficult to keep up with the work demands.
- Despite the existence of kitchen exhaust systems and windows, heat was evident in the environment.
- Kitchen has poor lighting.
- Noise from the equipment (Eg: Kitchen hood, food blenders) made communication between very difficult.
- The floor surfaces were wet.
- Never attended ergonomic related training.

(4 marks)

(c) Based on available information, identify the ergonomic risk assessment instrument suitable to assess the ergonomic hazard.

(2 marks)

(d) Based your answer in (c), assess the ergonomic risks.

(10 marks)

(e) For identified risk factors in (d), recommend **TWO (2)** control measures that can be taken by the employer.

(4 marks)

(f) Name **ONE (1)** modifiable risk factor of WRMSDs among workers.

(1 marks)

Question 5

Bungkus hantar Sdn Bhd contacted UniKL MESTECH requested for ergonomic risk assessment service. Ts. Lisa was then sent to Bungkus hantar Sdn Bhd to perform an Ergonomic Risk Assessment (ERA). ERA was done to various work process including packaging station. One of the employees, Mr. McGyver (ID No:GL0105), male, 55 years old and full- general worker was observed while performing his task. He works 6 days/ week, and 8 hours/day.

Mr. MacGyver is assigned to the packaging station which is the last section of the distribution process.

Descriptions of his tasks are as follows:

Step 1: To lift boxes from pallets to table in the packing station for packaging process.

Step 2: To transfer boxes (weight: 25 kg/box) from packing station to trolley.

Each trolley can hold 4 boxes per trip.

Step 3: To send boxes to store located more than 30 meters using trolley.

He is expected to deliver 20 boxes per hour to the store.

Total boxes are estimated 240 boxes/day.

Refer attachment for the following:

1. Information about Mr. McGyver.
2. Illustration on sending boxes using trolley.
3. Feedback from Mr. McGyver during the interview session.

NOTE: Graphic is for illustration only. Please read information given to assist your understanding.

Based on the information given, answer the following:

- (a) Identify **ONE (1)** possible ergonomic hazard. Next, name instrument used to assess the hazard.

(4 marks)

- (b) Using instrument mentioned in (a), assess the ergonomic risk.

(8 marks)

- (c) Based on identified risk factors in (b), recommend **TWO (2)** control measures.
(4 marks)

- (e) Determine **TWO (2)** physical hazards. Propose assessment methods for each.
(4 marks)

- (d) Analyse relationship between risk factors and work related musculoskeletal disorders (WRMSDs).
(5 marks)

END OF EXAMINATION PAPER

QUESTION 5

Information about Mr. McGyver

| | | | | | |
|---|---|-------------------|-------------------------------------|--------------------------------------|--|
| No of work breaks | <input checked="" type="checkbox"/> | Once | | Twice | |
| | | Thrice | | None | |
| Break duration | | Lunch: 60 minutes | <input checked="" type="checkbox"/> | Others: Yes – small break in between | |
| No of people working with you | | Alone | <input checked="" type="checkbox"/> | 2-5 person | |
| | | 6-10 person | | >10 person | |
| Do you smoke | <input checked="" type="checkbox"/> | Yes | | No | |
| | If smoking, no cigar smoked/day: 1 pack of 10 cigarettes/day | | | | |
| Hobby/leisure time activity | | Hunting | | Gardening | |
| | | Fishing | | Browsing internet | |
| | | Sports | | Others: baking | |
| Were you diagnosed of any illness by the doctor ? | <input checked="" type="checkbox"/> | Yes | | No | |
| | If <u>Yes</u> , state the disease, Hypertension, Diabetic | | | | |
| Are you taking any medication? | <input checked="" type="checkbox"/> | Yes | | No | |
| | If <u>Yes</u> , what medication are you taking? Don't remember | | | | |



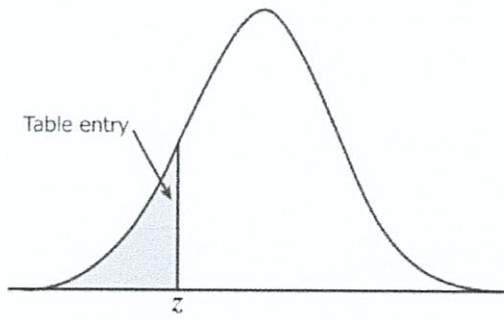
Sending boxes using trolley

Feedback from Mr. Mc.Gyver during the interview session

1

- He was allowed for informal breaks in between.
- The work was repetitive, and he was expected to deliver his task according to schedule.
- He needs to bend forward slightly while pushing the trolley.
- Dusty air in the storeroom, poor ventilation, poor lighting, and hot environment.
- Trolleys were in poor condition.
- Loads were unstable during transferring from packing station to store.
- The floor surfaces were dry, clean, and in good condition.
- The trolley has handhold areas, small uncomfortable handgrips.
- The size of the store's door was small making it difficult to enter the store.
- Corridor between packing station and store is narrow.
- Never attended ergonomic training

Z Table



Find values on the left of the mean in this negative Z score table. Table entries for z represent the area under the bell curve to the left of z . Negative scores in the z -table correspond to the values which are less than the mean.

| z | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| -3.4 | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | .0002 |
| -3.3 | .0005 | .0005 | .0005 | .0004 | .0004 | .0004 | .0004 | .0004 | .0004 | .0003 |
| -3.2 | .0007 | .0007 | .0006 | .0006 | .0006 | .0006 | .0006 | .0005 | .0005 | .0005 |
| -3.1 | .0010 | .0009 | .0009 | .0009 | .0008 | .0008 | .0008 | .0008 | .0007 | .0007 |
| -3.0 | .0013 | .0013 | .0013 | .0012 | .0012 | .0011 | .0011 | .0011 | .0010 | .0010 |
| -2.9 | .0019 | .0018 | .0018 | .0017 | .0016 | .0016 | .0015 | .0015 | .0014 | .0014 |
| -2.8 | .0026 | .0025 | .0024 | .0023 | .0023 | .0022 | .0021 | .0021 | .0020 | .0019 |
| -2.7 | .0035 | .0034 | .0033 | .0032 | .0031 | .0030 | .0029 | .0028 | .0027 | .0026 |
| -2.6 | .0047 | .0045 | .0044 | .0043 | .0041 | .0040 | .0039 | .0038 | .0037 | .0036 |
| -2.5 | .0062 | .0060 | .0059 | .0057 | .0055 | .0054 | .0052 | .0051 | .0049 | .0048 |
| -2.4 | .0082 | .0080 | .0078 | .0075 | .0073 | .0071 | .0069 | .0068 | .0066 | .0064 |
| -2.3 | .0107 | .0104 | .0102 | .0099 | .0096 | .0094 | .0091 | .0089 | .0087 | .0084 |
| -2.2 | .0139 | .0136 | .0132 | .0129 | .0125 | .0122 | .0119 | .0116 | .0113 | .0110 |
| -2.1 | .0179 | .0174 | .0170 | .0166 | .0162 | .0158 | .0154 | .0150 | .0146 | .0143 |
| -2.0 | .0228 | .0222 | .0217 | .0212 | .0207 | .0202 | .0197 | .0192 | .0188 | .0183 |
| -1.9 | .0287 | .0281 | .0274 | .0268 | .0262 | .0256 | .0250 | .0244 | .0239 | .0233 |
| -1.8 | .0359 | .0351 | .0344 | .0336 | .0329 | .0322 | .0314 | .0307 | .0301 | .0294 |
| -1.7 | .0446 | .0436 | .0427 | .0418 | .0409 | .0401 | .0392 | .0384 | .0375 | .0367 |
| -1.6 | .0548 | .0537 | .0526 | .0516 | .0505 | .0495 | .0485 | .0475 | .0465 | .0455 |
| -1.5 | .0668 | .0655 | .0643 | .0630 | .0618 | .0606 | .0594 | .0582 | .0571 | .0559 |
| -1.4 | .0808 | .0793 | .0778 | .0764 | .0749 | .0735 | .0721 | .0708 | .0694 | .0681 |
| -1.3 | .0968 | .0951 | .0934 | .0918 | .0901 | .0885 | .0869 | .0853 | .0838 | .0823 |
| -1.2 | .1151 | .1131 | .1112 | .1093 | .1075 | .1056 | .1038 | .1020 | .1003 | .0985 |
| -1.1 | .1357 | .1335 | .1314 | .1292 | .1271 | .1251 | .1230 | .1210 | .1190 | .1170 |
| -1.0 | .1587 | .1562 | .1539 | .1515 | .1492 | .1469 | .1446 | .1423 | .1401 | .1379 |
| -0.9 | .1841 | .1814 | .1788 | .1762 | .1736 | .1711 | .1685 | .1660 | .1635 | .1611 |
| -0.8 | .2119 | .2090 | .2061 | .2033 | .2005 | .1977 | .1949 | .1922 | .1894 | .1867 |
| -0.7 | .2420 | .2389 | .2358 | .2327 | .2296 | .2266 | .2236 | .2206 | .2177 | .2148 |
| -0.6 | .2743 | .2709 | .2676 | .2643 | .2611 | .2578 | .2546 | .2514 | .2483 | .2451 |
| -0.5 | .3085 | .3050 | .3015 | .2981 | .2946 | .2912 | .2877 | .2843 | .2810 | .2776 |
| -0.4 | .3446 | .3409 | .3372 | .3336 | .3300 | .3264 | .3228 | .3192 | .3156 | .3121 |
| -0.3 | .3821 | .3783 | .3745 | .3707 | .3669 | .3632 | .3594 | .3557 | .3520 | .3483 |
| -0.2 | .4207 | .4168 | .4129 | .4090 | .4052 | .4013 | .3974 | .3936 | .3897 | .3859 |
| -0.1 | .4602 | .4562 | .4522 | .4483 | .4443 | .4404 | .4364 | .4325 | .4286 | .4247 |
| -0.0 | .5000 | .4960 | .4920 | .4880 | .4840 | .4801 | .4761 | .4721 | .4681 | .4641 |

