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PROFESSIONAL COMPETENCY EXAMINATION 2026

INFORMATION FOR APPLICANTS

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1. INTRODUCTION

In line with the Registration of Engineers Act 1967 (Revised 2015), only registered Professional Engineers with a Practising Certificate can submit engineering plans to Local Authorities. In order to apply for a Practising Certificate, Professional Engineers must sit and pass the Professional Competency Examination (PCE) in their relevant branch of practice.

Presently, the PCE for the following branches of practice are in place:

No.	Branch of engineering
1.	Civil engineering
2.	Mechanical engineering
3.	Electrical engineering
4.	Chemical engineering
5.	Environmental engineering
6.	Mining engineering
7.	Geotechnical engineering
8.	Structural engineering
9.	Transportation engineering
10.	Automotive engineering

At present, the Board does not conduct the PCE for engineering branches other than those listed above.

This document is issued by the Board of Engineers Malaysia as information for Professional Engineers to prepare for the Professional Competency Examination.

2. AIMS OF THE PROFESSIONAL COMPETENCY EXAMINATION

The Professional Competency Examination will test the candidates within the limits of “professional engineering services” as defined in the Registration of Engineers Act 1967.

The examination will also test the candidate’s knowledge, experience and application of:

- (a) Regulations and rules of engineering practice by BEM
- (b) Statutory laws, codes, regulations
- (c) Standards of professionalism and ethical behaviour imposed by BEM

3. THE PROFESSIONAL COMPETENCY EXAMINATION

The Professional Competency Examination is conducted by the Board of Engineers Malaysia pursuant to Subparagraph 4(1)(ed)(ii) of the Registration of Engineers Act 1967 (Revised 2015).

The Board shall appoint an Examination Panel, consisting of such members from amongst the registered Professional Engineers to assist in conducting the Examination.

4. ELIGIBILITY TO SIT FOR THE EXAMINATION

Professional Engineer wishing to sit for the Professional Competency Examination (PCE) shall apply to the Board of Engineers Malaysia via MyBEM (www.engineer.org.my).

Eligible candidates for the examination must be **Professional Engineer (Ir.)** registered with the Board in the appropriate branches.

On approval of the candidate's application by the Board, the candidate is allowed to sit for the examination.

5. FEE TO SIT FOR THE EXAMINATION & ONLINE PAYMENT

NEW Candidate

The fee to sit for the Professional Competency Examination is **RM1,000.00** with an additional fee of **RM100.00** as processing fee (non-refundable).

RE-SIT candidate

The **RE-SIT** fee for the Professional Competency Examination is **RM500.00** for each paper taken with an additional fee of **RM100.00** as processing fee (non-refundable).

6. DATE OF EXAMINATION

The Professional Competency Examination will be held on **24th – 25th October 2026 (Saturday & Sunday)**.

7. EXAMINATION VENUE

The examination center's will be:

1) Kuala Lumpur

Venue: Bangunan Peperiksaan, University of Malaya

2) Kuching

Venue: Swinburne University of Technology, Sarawak Campus

3) Kota Kinabalu

Venue: Institut Latihan Jabatan Kerja Raya, Jalan Kepayan

Candidates whose application have been approved will be duly informed of the final location **not later than two (2) weeks before the examination** via MyBEM.

BEM has a right to postpone or cancel the examination or change its venue at any time with a prior notice publish on the BEM website.

8. REGISTRATION TO SIT FOR PCE

Applicants to submit complete application at MyBEM. Please click here: [MyBEM \(engineer.org.my\)](http://MyBEM(engineer.org.my)) for guideline to apply.

The CLOSING DATE for the application is 31st AUGUST 2026 (Monday).

Applicants are allowed to change his / her discipline paper by informing the Board **before 4th October 2026**. Requests made later than this date will not be entertained.

9. FINAL RESULTS AND NOTIFICATION

- Candidates for the examination will be notified of their results **three months** after the examination date.
- **Examination results** will be given to candidates on a **Pass/Fail basis**.
- Upon passing the Professional Competency Examination, the candidate may apply to be registered as a Professional Engineer with a Practicing Certificate **within one year** at MyBEM.
- No examination scores or marks will be given to the candidates.

10. EXAMINATION APPEALS

A candidate who fails the examination may submit a written appeal at MyBEM to review his/her performance together with a payment of RM400.00.

The appeal is to be made within two (2) weeks after the receipt of the results. Late appeals will not be entertained. The result of the appeal will be updated at MyBEM. The findings of the appeal by the BEM will be final. No further appeal will be allowed.

11. COURSES FOR THE EXAMINATION

The Board does not endorse any course conducted or provide material as study aids for the examination.

12. REFUND OF EXAMINATION FEES

When the applicant's application has been accepted but he/she is unable to sit for the examination, the Board may, at its discretion, refund the examination fee RM500.00 to the applicant upon informing the Board **at least two weeks before the examination date or submit a medical certificate within two weeks after the examination.**

There will be **no refund** if the applicant informs the Board **less than two weeks** before the examination date.

13. NO SHOW BY THE CANDIDATES FOR THE EXAMINATION

Candidates who do not attend the examination for whatever reasons will be marked as "*No Show*". Their examination fees will be forfeited and no refund or credit will be transferred for the next sitting.

14. IDENTIFICATION OF THE CANDIDATES AT THE EXAMINATION CENTRE

Candidates sitting for the examination must bring along identification documents for inspection at the Examination Centre. The identification documents for local candidates shall be their identity cards while for foreign candidates, it shall be their passports.

15. FORMAT OF THE EXAMINATION PAPERS IN THE VARIOUS DISCIPLINES

The Examination is an open book examination and shall be in two parts: Part A and Part B.

A candidate must pass both Part A and B in order to pass the whole examination. A candidate at his/her first sitting must sit for both Part A and B together.

Subsequently, a candidate who has failed Part B but passed Part A is allowed to RE-SIT for Part B only **within the following seven (7) years**.

In the event of failure, in Part B in the following seven (7) years, the applicant has to re-sit the whole examination again. This ruling will be similarly applied to the case when an applicant has passed Part B but failed Part A.

The Part A and Part B of the examination are as follows:

Part A	
Common Paper to be taken by all candidates, which will be non-technical in nature but will test the candidates' knowledge on laws governing the profession, the responsibility of a professional towards the general public and standards of professionalism and ethical behavior.	
There are two papers for this Part i.e. Paper 1 and Paper 2. Candidates must pass both papers at one sitting.	
Common Paper 1	• 40 objective questions to be answered in 1 hour 45 minutes • Passing mark is 50%
Common Paper 2	• 5 long/essay questions of which 3 are to be answered in 2 hours + 15 minutes to read the Question • Passing mark is 50%

Part B	
This will be the technical paper, which shall be on Civil, Electrical, Mechanical, Chemical, Environmental, Mining, Geotechnical, Structural and Transportation engineering. Candidates shall sit for the paper in the relevant subject, which they wish to practice. The Examination shall test the candidates' competency within his/her respective field of practice.	
There are two papers for this Part i.e. Paper 1 and Paper 2. Candidates must pass both papers at one sitting.	

Civil Paper 1	• 40 objective questions to be answered in 1 hour 45 minutes • Passing mark is 50%
Civil Paper 2	• 5 long/essay questions of which 3 are to be answered in 2 hours + 15 minutes to read the Question • Passing mark is 50%
Electrical Paper 1	• 40 objective questions to be answered in 1 hour 45 minutes • Passing mark is 50%
Electrical Paper 2	• 5 long/essay questions of which 3 are to be answered in 2 hours + 15 minutes to read the Question • Passing mark is 50%
Mechanical Paper 1	• 40 objective questions to be answered in 1 hour 45 minutes • Passing mark is 50%
Mechanical Paper 2	• 5 long/essay questions of which 3 are to be answered in 2 hours + 15 minutes to read the Question • Passing mark is 50%
Chemical Paper 1	• 40 objective questions to be answered in 1 hour 45 minutes • Passing mark is 50%
Chemical Paper 2	• 5 long/essay questions of which 3 are to be answered in 2 hours + 15 minutes to read the Question • Passing mark is 50%
Environmental Paper 1	• 40 objective questions to be answered in 1 hour 45 minutes • Passing mark is 50%
Environmental Paper 2	• 5 long/essay questions of which 3 are to be answered in 2 hours + 15 minutes to read the Question • Passing mark is 50%
Mining Paper 1	• 40 objective questions to be answered in 1 hour 45 minutes • Passing mark is 50%
Mining Paper 2	• 5 long/essay questions of which 3 are to be answered in 2 hours + 15 minutes to read the Question • Passing mark is 50%
Geotechnical Paper 1	• 40 objective questions to be answered in 1 hour 45 minutes • Passing mark is 50%
Geotechnical Paper 2	• 5 long/essay questions of which 3 are to be answered in 2 hours + 15 minutes to read the Question • Passing mark is 50%

Structural Paper 1	• 40 objective questions to be answered in 1 hour 45 minutes • Passing mark is 50%
Structural Paper 2	• 5 long/essay questions of which 3 are to be answered in 2 hours + 15 minutes to read the Question • Passing mark is 50%
Transportation Paper 1	• 40 objective questions to be answered in 1 hour 45 minutes • Passing mark is 50%
Transportation Paper 2	• 5 long/essay questions of which 3 are to be answered in 2 hours + 15 minutes to read the Question • Passing mark is 50%
Automotive Paper 1	• 40 objective questions to be answered in 1 hour 45 minutes • Passing mark is 50%
Automotive Paper 2	• 5 long/essay questions of which 3 are to be answered in 2 hours + 15 minutes to read the Question • Passing mark is 50%

The syllabus for the examination in the various disciplines are available on the BEM website.

SAMPLE QUESTIONS

Common Paper 1

Objective Questions

Q1. A Main Contractor (A) owes a sub-contractor (B) RM2 Million for work done under a sub-contract and fails to pay B. Subsequent to protracted negotiations, B agrees to accept from A a payment of RM1 Million in satisfaction of the whole debt. What is the effect of this agreement?

A. B can still claim the outstanding RM1 Million.

☐

B. B can challenge the agreement on the basis of economic duress.

☐

C. The whole debt is discharged .

☐

D. The agreement is void in law.

☐

E. B can only claim under Common Law.

☐

SAMPLE QUESTIONS

Common Paper 1

Objective Questions

Q2. Which of the following statement is/are true?

- a) Only Mechanical Professional Engineers can submit active fire protection plans.
- b) Only Civil or Mechanical Professional Engineers can submit passive fire protection plans for industrial buildings.
- c) Professional Engineers of any discipline can submit active fire protection plans.
- d) Only Electrical Professional Engineers can submit electrical plans.

A. a) only

☐

B. a) and b) only

☐

C. a), b) and d) only

☐

D. c) only.

☐

E. b), c) and d) only

☐

SAMPLE QUESTIONS

Common Paper 1

Objective Questions

Q3. In the event of any change of consultant after works have commenced, who is responsible for informing the relevant local authority concerned of the change?

A. Original/First consultant.

☐

B. Replacement consultant.

☐

C. Employer.

☐

D. Board of Engineers Malaysia (BEM).

☐

E. Any of the above.

☐

SAMPLE QUESTIONS

Common Paper 1

Objective Questions

Q4. If the original/first consultant refuses and/or neglects to issue a Letter of Release (LOR), to which body must a complaint be made?

A. Association of Consulting Engineers, Malaysia (ACEM).

☐

B. Ministry of Works.

☐

C. Board of Engineers Malaysia (BEM)

☐

D. The Institution of Engineers, Malaysia (IEM).

☐

E. Any of the above.

☐

SAMPLE QUESTIONS

Common Paper 1

Objective Questions

Q5. Which of the following statement is false?

- | | |
|--|--------------------------|
| A. The BEM Scale of Fees is mandatory | ☐ |
| B. A Sole Proprietorship practicing as an ECP must be registered with BEM | ☐ |
| C. All ECPs must be registered with BEM. | ☐ |
| D. Professional Fees based on man months do not contravene the BEM Scale of Fees. | ☐ |
| E. For a private project, a consultant may exclude provision of supervision and hence need not charge the corresponding professional fees. | ☐ |

SAMPLE QUESTIONS

Common Paper 2

Subjective Questions

Q1. A contractor applies for Extension of Time (EOT) before his contract completion period expires. The Contract Administrator does not respond and the original contract completion date is passed. One month later, the Contract Administrator issues a V.O. for additional works to the Contractor. The Contractor refuses to carry out the V.O. works. What can the Contract Administrator do under this situation?

(100 marks)

Q2. A Consultant has carried out substantial works on a project and the Employer encounters financial difficulties. He suspends the project. On resumption, he terminates the Consultant's employment citing use of in-house consultants to complete the works due to financial constraints.

a. What is the legal effect of the termination? Elaborate your answers with respect to the LOR and statutory requirements.

(50 marks)

b. What action should the consultant take to protect his interest and what financial compensation can the consultant seek?

(50 marks)

SAMPLE QUESTIONS

Common Paper 2

Subjective Questions

Q3. PEPC X is appointed by Owner Z based on the BEM Model Form of Agreement. By the time construction has begun, Z has persistently defaulted on paying fees to X despite repeated requests for timely payment in accordance with the Consultancy Agreement.

X decides to terminate his services while construction is still on-going.

How should X go about doing so properly:

a) without contravening any statutory requirements?

(20 marks)

, and

b) without risking being counter-sued by Z for causing delay and losses to the project? (80 marks)

(80 marks)

SAMPLE QUESTIONS

Civil Engineering Paper 1

Objective Questions

Q1. From the appropriate Table in BS 8110 determine the bending moments of short span on a rectangular slab freely supported on all four sides (corners not held down) and subjected to a load of $g_k = 4 \text{ kN/m}^2$ and $q_k = 6 \text{ kN/m}^2$, when $l_x = 3.0 \text{ m}$ & $l_y = 3.75 \text{ m}$.

A. 7.70 kNm.

☐

B. 12.18 kNm.

☐

C. 5.02 kNm.

☐

D. 3.22 kNm.

☐

E. 9.75 kNm.

☐

SAMPLE QUESTIONS

Civil Engineering Paper 1

Objective Questions

Q2. Based on stress distribution in a semi-infinite elastic solid by the Boussinesq solution, what is the critical depth in which the increase in stresses is only about 10 percent of the applied stress on a square footing? This depth is usually the critical depth for settlement assessment of a footing.

A. 0.5 times of footing width (0.5B)

☐

B. 2.0 times of footing width (2.0B)

☐

C. 5.0 times of footing width (5.0B)

☐

D. 10.0 times of footing width (10.0B)

☐

E. 15.0 times of footing width (15.0B)

☐

SAMPLE QUESTIONS

Civil Engineering Paper 1

Objective Questions

Q3. Which of the following statements are true for circular column?

A. Minimum no. of bars is 8, size of bar is not less than 10 mm.

☐

B. Minimum no. of bars is 8, size of bar is not less than 12 mm.

☐

C. Minimum no. of bars is 6, size of bar is not less than 10 mm.

☐

D. Minimum no. of bars is 6, size of bar is not less than 12 mm.

☐

E. None of the above.

☐

SAMPLE QUESTIONS

Civil Engineering Paper 1

Objective Questions

Q4. What is the minimum residual pressure head for an external hydrant system required by Bomba?

A. 3.0m.

☐

B. 7.5m.

☐

C. 12.5m.

☐

D. 10.0m.

☐

E. 15.0m.

☐

SAMPLE QUESTIONS

Civil Engineering Paper 1

Objective Questions

Q5. What is the fire resistance requirement of a concrete structure for an underground basement car-park?

A. One hour.

☐

B. Half an hour.

☐

C. Two hours.

☐

D. Three hours.

☐

E. Four hours.

☐

SAMPLE QUESTIONS

Civil Engineering Paper 2

Subjective Questions

- Q1. You are the infrastructure engineer for a 500 acre housing development scheme. What is your advice to the Developer, Planners and Architects in terms of requirements for drainage for the whole development?
- (100 marks)
- Q2. A 3-storey basement car park is to be built with an excavation of approximately 15.0m from the existing ground level. The water table is 1.0m below the existing ground level. You are required to provide a solution on the structural system for the retaining walls of the basement.
- (100 marks)

SAMPLE QUESTIONS

Mechanical Engineering Paper 1

Objective Questions

Q1. In HVAC systems, Coefficient of Performance (COP), is defined as:

- A. Input electrical power in kW / Output cooling capacity in kW.
- B. Output cooling capacity in W / Input electrical power in W.
- C. Input electrical power in kW / Output cooling capacity in RT.
- D. Output cooling capacity in Btu/hr / Input electrical power in kW.
- E. None of the above.

☐☐☐☐☐

SAMPLE QUESTIONS

Mechanical Engineering Paper 1

Objective Questions

Q2. “Reverse Return” is a term commonly used in;

A. Steam piping system.

☐

B. Chilled water piping system.

☐

C. Ductwork system.

☐

D. Sanitary piping system.

☐

E. Gas piping system.

☐

SAMPLE QUESTIONS

Mechanical Engineering Paper 1

Objective Questions

Q3. For an 8-storey, 32m tall medium cost apartment, what are the minimum systems to be provided?

- i. Automatic Fire Alarm system
- ii. Wet riser system
- iii. Sprinkler system
- iv. Portable Extinguishers
- v. Fire lift
- vi. Dry riser system
- vii. Downcomer system

A. i, iv, v and vii

☐

B. i, ii, iii, iv and v

☐

C. i, iv, v and vi

☐

D. i, ii, iv and v

☐

E. i, iii, iv and v

☐

SAMPLE QUESTIONS

Mechanical Engineering Paper 1

Objective Questions

Q4. Loading and Discharge units in plumbing system refers to

A. Total water weight in pipes.

☐

B. Total volumetric flows.

☐

C. Fluid viscosity in carrier pipe.

☐

D. Reynolds number.

☐

E. None of the above.

☐

SAMPLE QUESTIONS

Mechanical Engineering Paper 1

Objective Questions

Q5. Fire lifts are required for buildings where the topmost occupied floor is

A. Over 30.5m.

☐

B. Over 18.5m.

☐

C. Over 1,000m².

☐

D. Over 18.5m and 1,000m².

☐

E. Over 30.5m and 1,000m².

☐

SAMPLE QUESTIONS

Mechanical Engineering Paper 2

Subjective Questions

- Q1. You are appointed to design the air conditioning and mechanical ventilation system for the retrofit of a 20 year old, 25 storey Office Building with a nett rentable area of 1500m² per floor. Your client requires for the new air conditioning system to have minimum running costs and with flexibility to cater for after normal office hour occupation by some of the tenants.

List the types of air conditioning systems you would consider and recommend. Elaborate the reasons for your recommendation and how you would ensure compliance to current local authorities requirements. Also list down specific areas not within your responsibilities and capabilities where you need your client to seek expert advice.

(100 marks)

- Q2. You are required to undertake the design and supervision of the fire protection services for a Mixed Commercial Development. The architectural drawings show the following layout;

- 3 Basement car park floors of gross area 15,000m² per floor and 3.5m height.
- 4 Storey Shopping Floors Podium. Each floor of gross area 12,000m² and floor to floor height of 4.5m
- A Hypermarket of 10,000m² on ground floor and a Department Store of 6000m² on 1st floor.

List the types of fire protection installations required by Bomba and the basis of such requirements. Describe the design concept you would propose for the following installations and their reasons;

- Automatic Sprinkler System
- Smoke Control System

(100 marks)

SAMPLE QUESTIONS

Electrical Engineering Paper 1

Objective Questions

Q1. Select the statement which **DO NOT** describe the function of the Minister under 'The Electricity Supply ACT'.

A. Efficient use of energy.

☐

B. Power to fix tariff for electricity.

☐

C. Competency of persons in charge.

☐

D. Licensing of electrical installation.

☐

E. Control of electrical equipment and plant for safety.

☐

SAMPLE QUESTIONS

Electrical Engineering Paper 1

Objective Questions

Q2. Select the CORRECT condition(s) where Standby Generator–Alternator Set is **mandatory** under the Uniform Building By-Law:

- | | |
|---|--------------------------|
| A. Standby supply for hose reel pump where hose reel system is required under the Tenth Schedule. | ☐ |
| B. Standby supply for sprinkler pump where sprinkler system is required under the Tenth Schedule. | ☐ |
| C. In a building where the top occupied floor is over 18.5m above fire appliance access level. | ☐ |
| D. Standby supply for hydrant pump where pressurised hydrant system is required under the Tenth Schedule. | ☐ |
| E. All of the above. | ☐ |

SAMPLE QUESTIONS

Electrical Engineering Paper 1

Objective Questions

Q3. What is the expected minimum short circuit rating for the TNB system at 11kV?

A. 40 kA for 3 sec.

☐

B. 20kA for 3 sec.

☐

C. 25 kA for 3 sec.

☐

D. 31.5 kA for 3 sec.

☐

E. 18 kA for 3 sec.

☐

SAMPLE QUESTIONS

Electrical Engineering Paper 1

Objective Questions

Q4. Select the item NOT classified as an Electro-magnetic Compatibility (EMC) phenomena.

A. Electrostatic discharge.

☐

B. H.F. interference.

☐

C. L.F. interference._

☐

D. Voltage dip or surge.

☐

E. Transient.

☐

SAMPLE QUESTIONS

Electrical Engineering Paper 1

Objective Questions

Q5. Which of the following is true about optical fibre?

- A. A single-mode fibre carries less traffic than a multimode fibre._
- B. A single mode fibre can carry data a longer distance than a multimode fibre.
- C. A single mode fibre can carry data a shorter distance than a multimode fibre.
- D. A single mode fibre requires only one cable for communication whereas a multimode fibre requires a minimum of 2 cables.
- E. A single mode fibre carries data only in one direction.

☐☐☐☐☐

SAMPLE QUESTIONS

Electrical Engineering Paper 2

Subjective Questions

Q1. Answer ALL parts:

- a. List ALL the functions of the Minister under 'The Electricity Supply Act' and describe briefly similarities with the Sarawak Electricity Ordinance.

(50 marks)

- b. List the departments or agencies the electrical engineer must submit for approval in a typical project.

(50 marks)

SAMPLE QUESTIONS

Electrical Engineering Paper 2

Subjective Questions

Q2. You are requested to plan the electrical installation for a modern 8-storey commercial building given the following information:

- a. Building aircond with 1x35kW ACPU serving basement and ground floor, 6 sets 17kW APU for each of the other floors and 1x7kW and 1x25kW ACPU on the 8th Floor.
- b. 1x15kW lift motor at motor room at roof.
- c. 1x15kW water pump at basement floor.
- d. Lighting and other power loads per floor (including basement and ground) estimated at 5kW and 4kW respectively.
- e. The landlord will be responsible for the consumption with respect to air conditioners on all floors, lift, water pumps, lighting in staircase and lighting and power in basement.
- f. The basement floor will house TNB substation and consumer main switch board whilst the rest of the floors will be sublet for offices.

Draw a single line diagram of the installation showing the sizes of main conductors, method of running, rating of switches and metering arrangement on the main intake board and individual metering by TNB for each floor

(100 marks)

SAMPLE QUESTIONS

Chemical Engineering Paper 1

Objective Questions

- Q1. A polymer dose of 0.6 mg/L is required for the treatment of an industrial effluent. If the specific gravity of the 0.5% liquid polymer is 1.0 and the effluent flow is 100m³/hr, calculate the polymer feed rate of the dosing pump in mL per minute.
- (A) 1 mL/min
 - (B) 5 mL/min
 - (C) 200 mL/min
 - (D) 1200 mL/min
 - (E) 2000 mL/min

SAMPLE QUESTIONS

Chemical Engineering Paper 1

Objective Questions

Q2. Referring to ASTM E 1226, explosion severity of dust explosion hazard can be classified to the following categories based on test using 1 m³ and 20 L vessels and 10 KJ ignition source. Which of the following statement are true?
K_{st} is explosion severity of dust cloud.

- i. Dust explosion class, St 0 with K_{st} of 0 bar. m/s is characterised as non-explosible.
- ii. Dust explosion class, St 0 with K_{st} of 0 to 200 bar. m/s is characterised as weak to moderate explosible
- iii. Dust explosion class, St 0 with K_{st} of 210 to 250 bar. m/s is characterised as strong explosible
- iv. Dust explosion class, St 0 with K_{st} more than 500 bar. m/s is characterised as strong explosible

- A. (i), (iii)
- B. (i), (ii), (iii)
- C. (ii), (iii), (iv)
- D. (ii), (iv)
- E. (i), (ii), (iii), (iv)

SAMPLE QUESTIONS

Chemical Engineering Paper 2

Subjective Questions

Q1. The final discharge point from any wastewater treatment plant is the point where the treated effluent is discharged after the last unit process of the industrial effluent treatment system (IETS).

- a) Please list down FIVE specifications of point of discharge as stipulated in the Fifth Schedule of the Industrial Effluent Regulations, 2009.
- b) If you notice that your client is violating the rules, with reference to the Board of Engineers Malaysia (BEM) Code of Professional Conduct, suggest your actions.

(100 marks)

SAMPLE QUESTIONS

Environmental Engineering Paper 1

Objective Questions

- Q1. Which of the following is not a critical parameter to be monitored for a dissolved air floatation (DAF) unit in a wastewater treatment plant?
- A. Outlet suspended solids concentration
 - B. pH
 - C. Air to solids ratio
 - D. Outlet oil concentration
 - E. Inlet stream flowrate
- Q2. A gas flow measured at STP is $30.0 \text{ m}^3/\text{min}$. Estimate the gas flow rate if the temperature and pressure at 40°C and 2.0 atm .
- A. $1.6 \text{ m}^3/\text{min}$
 - B. $15.8 \text{ m}^3/\text{min}$
 - C. $40 \text{ m}^3/\text{min}$
 - D. $60.0 \text{ m}^3/\text{min}$
 - E. No change in the flowrate

SAMPLE QUESTIONS

Environmental Engineering Paper 2

Subjective Questions

Q1. A reiver been identified as a potential source of raw water for a district. The characteristic of raw water samples from the river is follows:

- pH: 6-9
- DO: 5-7 mg/l
- TDS: 1000 mg/l
- TSSL 50 mg/l
- Turbidity: 50 NTU
- Faecal coliform: 100 count/100ml
- Total coliform: 5000 count/100ml

Sketch a treatment process flow that would be able to treat the water to meet the MOH's quality standard.

(100 Marks)

SAMPLE QUESTIONS

Geotechnical Engineering Paper 1

Objective Questions

- Q1. Which of the following is NOT the purpose of slope stability analysis?
- A. To predict the weathering profile in a residual weathered formation
 - B. Assess slope stability under short-term and long term condition
 - C. Evaluate possibility of landslides involving natural and existing engineered slopes
 - D. Redesign failed slopes and plan for design of preventive and remedial measures
 - E. Analyze landslides and understand failure mechanism and influence of environmental factors

SAMPLE QUESTIONS

Geotechnical Engineering Paper 1

Objective Questions

Q2. Which of the following statements is/are TRUE?

- i. A transverse load applied to a group of vertical piles with a fixed head condition may result in a combination of compression, tension and transverse forces in the individual piles
- ii. If the load capacity of piles is fully derived from end-bearing founded on bedrock, group reduction factors generally need not be applied
- iii. The maximum axial compressive stress under working load that may be applied to a prestressed concrete pile acting as a short strut should be $\frac{1}{4} \times$ (specified works cube strength at 28 days plus the prestress after losses)
- iv. During bored piling process, bentonite slurry is kept below groundwater level to prevent formation of bentonite cake
- v. Bentonite is a clay which principally contains kaolinite

- A. (i) and (ii)
- B. (i) and (v)
- C. (ii) and (iii)
- D. (iii) and (iv)
- E. (iv) and (v)

SAMPLE QUESTIONS

Geotechnical Engineering Paper 2

Subjective Questions

- Q1. 1. List and explain three (3) circumstances under which a pile foundation is required instead of shallow pad footing.

(20 marks)

2. Why base resistance is NOT ADVISABLE to be adopted in the design of micropile socketed in karstic limestone bedrock?

(10 marks)

3. Bored pile of 900mm diameter and 48m length is drilled and cast in the ground with the details as shown in the table.

Layer	Thickness (m)	Average SPT N
1	10	12
2	15	15
3	6	25
4	7	32
5	20	100

The design parameters and criteria are:

- i. Ultimate unit shaft resistance, $f_u = 3N$ kPa ($N < 20$)
- ii. Ultimate unit shaft resistance, $f_{su} = 2N$ kPa ($N > 20$)
- iii. f_{su} is limited to 150 kPa
- iv. Ultimate unit base resistance, $f_{bu} = 40N$ kPa
- v. f_{bu} is limited to 3000 kPa
- vi. FOS (Shaft) = 2 and FOS (Base) = 3

- vii. Concrete Grade 35 N/mm²
- viii. steel $f_y = 500$ MPa (high yield)
- ix. Reinforcement cover = 75mm

(a) Calculate the maximum allowable structural compression capacity of the pile based on BS 8004.

(10 marks)

(b) Calculate the allowable geotechnical compression capacity of the pile.

(30 marks)

(c) The pile is subjected to a service moment of 750 kNm and service vertical load of 5000 kN. Design the main steel reinforcement bars. Assume load factor of 1.5 for all loadings and 25mm as main bar. (Design chart for circular column attached).

(30 marks)

SAMPLE QUESTIONS

Mining Engineering Paper 1

Objective Questions

- Q1. The recovery of accessory minerals of alluvial cassiterite usually uses magnetic and high- tension separation methods. Which of the following minerals are magnetic and also a non- conductor.
- A. ilmenite and xenotime
 - B. Monazite and xenotime
 - C. Zircon and ilmenite
 - D. Zircon and monazite
- Q2. Chalcopyrite is regarded as fool's gold but it is one of the most important ore.
- A. Tin and lead
 - B. Iron
 - C. copper
 - D. sulphur
 - E. Tin

SAMPLE QUESTIONS

Mining Engineering Paper 2

Subjective Questions

- Q1. a) What is the difference between prospecting and exploration? Discuss briefly in term of operation and legislation.

(60 marks)

- b) An iron ore deposit has a mean grade of 63% Fe. During the course of mining, 30% fines by weight are generated at a grade of 72% Fe which are rejected. What is the effective mean grade of the deposit in Fe percentage?

(40 marks)

SAMPLE QUESTIONS

Transportation Engineering Paper 1

Objective Questions

- Q1. When preparing Road Safety Audit reports for Stage 1 (Planning and Feasibility) and Stage 2 (Preliminary Design), which of the following is not included in provision for users with special needs?
- A. Pedestrians
 - B. Pedal cyclists
 - C. Motorcyclists
 - D. People with disabilities
 - E. Cars
- Q2. Which of the following is NOT correct regarding Highway Engineering?
- A. Highway Engineering is a specialized field of Civil Engineering
 - B. Highway Engineering is a specialized field of Transportation Engineering
 - C. Highway Engineering covers the sub-specialisation field of Pavement Engineering
 - D. Highway Engineering covers the design of concrete road pavements
 - E. None of the above

SAMPLE QUESTIONS

Transportation Engineering Paper 2

Subjective Question

Q1. Answer both questions (a) and (b) below:

- a) Describe what is a multimodal transport system. List out and elaborate on its advantages.

(50 marks)

- b) You are required to plan a multimodal transport system connecting Malacca City and KLIA in Sepang, Selangor. Describe your basic framework for planning the transportation system.

(50 marks)

SAMPLE QUESTIONS

Automotive Engineering Paper 1

Objective Questions

- Q1. Which of the following is not considered as a chassis of an automobile?
- A. Ladder-type chassis
 - B. Step-chassis
 - C. Monocoque body
 - D. Cabin of a truck
 - E. Tubular space frame
- Q2. All land vehicles are design to carry a specific purpose. Which of the following is not true of the purpose of the good carrying vehicles?
- A. Lorry general cargo
 - B. Concrete pump truck
 - C. Lorry vehicle carrier
 - D. Lorry tanker
 - E. Lorry curtain sided

SAMPLE QUESTIONS

Automotive Engineering Paper 2

Subjective Question

Q1. The coefficient of rolling resistance for a truck weighing 62293.5 N is 0.018 and the coefficient of air resistance is 0.0276 in the formula $R = KW + K_a AV^2$ N, where A is m^2 of the frontal area and V the speed in km/h. The transmission efficiency in top gear of 6.21:1 is 90% and that in the second gear of 15:1, is 80%. The frontal area is 5.574 m^2 . If the truck has to have a maximum speed of 88 km/h in top gear, calculate:

- (i) The engine brake horse power required
(25Marks)
- (ii) The engine speed if the driving wheels have an effective diameter of 0.8125 m
(25Marks)
- (iii) The maximum grade the truck can negotiate at the above engine speed in second gear;
(30marks)
, and
- (iv) The maximum draw-bar pull available on level at the above engine speed in second gear.
(20marks)

SAMPLE QUESTIONS

Automotive Engineering Paper 2

Subjective Question

- Q2.
- (i) Briefly describe the importance of seat anchorage for M2 and M3 vehicle in the event of a road crash.
(30 marks)
 - (ii) Name one commonly accepted Regulation adopted by the Road Transport Department Malaysia.
(10 Marks)
 - (iii) Briefly describe the requirements of this standard to M2 and M3 vehicles.
(60 marks)