GHANA INSTITUTION OF ENGINEERS

Essay Topics for Engineers Professional Examination

The following list of essay titles indicates the range of Community and Management topics in which a candidate should have gained some understanding before becoming a member of Ghana Institution of Engineers (GhIE). Candidates will be expected to use their own field of experience to answer the questions set.

A candidate will be expected to demonstrate:

(a) That he or she can write clear and concise English that is intelligible to laymen;

(b) That he or she thought sufficiently about the role of the engineer in society to be able to form a view of the social value of his own work and uphold that view in discussions with the lay;

(c) That he or she has a sufficient knowledge of management concepts to the able to operate effectively as a potential leader in engineering field.

PLEASE SELECT ANY ONE OF THE UNDERLISTED TOPICS AND WRITE ONE THOUSAND FIVE HUNDRED WORDS (1500) ESSAY ON ONLY ONE.

1. Explain the process of management decision-making and explore the extent to which subordinates may participate in the process.

2. Identify and discuss various factors which influence the selling price of a product or service marketed by an engineering industry with which you are familiar. Illustrate your answer with an example that shows how these factors can combine to determine the price.

3. Human Resource Development, Good Governance and Private Sector Development are key priorities of Government development programs. In what ways can engineers contribute to these goals?

4. Poverty Reduction and Economic Growth are important objectives of government. In what ways can engineers contribute to these goals?

5. To what extent should the public be involved in the decision-making process for infrastructure projects? What role should engineers play in such consultations? Use your field of engineering as a basis.

6. “The estimation of cost of schemes and their budgetary control is one of the key functions of the engineer”. How should engineers be trained to fulfil this function in design, fabrication, installation and construction.

7. Identify the areas in which disagreement between a Resident Engineer’s staff and the Contractor’s staff may develop. How can good relations be achieved between these parties? Illustrate where possible from your own experience.

8. “Delegation to the lowest possible level is often quoted as essential to efficient management”. Discuss how effective delegation of responsibility can be achieved in an engineering organisation.

9. Many large engineering projects nowadays are undertaken by joint ventures. Describe the advantages and disadvantages.

10. To be effective, an organisation must come to terms with the various significant elements of its social environment. What is the “social environment” with which it must relate, and how does it come to terms with the significant elements in it.

11. Energy must be used more efficiently, simply because it is no longer cheap, although savings may be limited to the extent to which consumers find changes in their way of life acceptable. How do you think a government should set about encouraging domestic consumers to make more efficient use of energy?

12. Environmental Impact Assessment, Social Impact Assessment and Resettlement Action plans have become important elements of development projects. Discuss.

13. Why should the environmental impact of public works projects be assessed and how can this be taken into account in the evaluation of the merits or demerits of such projects?

14. Discuss the contributions which engineers could make to energy conservation.

15. Recent years have seen increased national and international regulations on the control of many forms of pollution. Discuss the consequences of observing these regulations.

16. Write about 250 words on “Style for Technical writing “Assume that your text is to be included in a pamphlet giving advice on the preparation of technical reports. Write mainly in a direct second person style. For example “In choosing language for technical writing, you .....

17. Imagine that, after some years at work, you are now employed by a large manufacturing organisation. A small group of newly qualified engineers has just been recruited as assistant supervisors. The Personnel Department has asked you to give a talk on the managerial aspects of their new roles. Write down your notes for this talk.

18. One mark of a mature profession is a consciousness of its own history. How important is it for today’s engineer to see his work in historical perspective.

19. Do engineers learn form the past? Explain your views with supporting examples.

20. The Company in which you work has decided to reorganise its training scheme for managers and potential managers. Anyone may submit suggestions. Set out your proposals. Give reasons for advocating any particular course of action.

21. Choose any engineering operation you have seen and make a critical review of the types of accidents that could possibly occur. Using this as basis, outline the measures which should be taken both to meet the statutory requirements for safety and to make staff aware of the dangers.

22. You are a Project Manager in charge of a small team of engineers working on a project which has a limited budget and on important completion date. Explain what principles of management you would employ in planning and controlling the work for which you are accountable.

23. Compare the advantages and disadvantages of financing infrastructure development from public and private sources.

24. Lack of good maintenance culture and practices have been blamed for the rapid deterioration of the Nation’s assets. Discuss ways to address this deficiency.

25. There has been concern on “over specification” and “under specification” of equipment, machineries and complete systems. Describe the technical and financial implications of such lapses and how they could be minimised.

26. Describe a programme of action involving customers and the power utility companies for improving the system power factor. Discuss the benefits of such a programme.

27. Prescribe solutions for addressing the deficit of electrical energy in Ghana; taking into account alternative sources of power production.

28. Outline the criteria you would use to justify a new design for a machine in use at your organisation. Also give details for fabrication, installing and training both operational and maintenance personnel.

29. A significant element in any market is the size and number of producers. Discuss this in relation to your field of engineering.

30. The way in which engineers handle their data is a central importance to their efficiency and effectiveness. Discuss.

31. How has the application of computers affected the engineering industry? Comment also on the attendant risks involved in adopting computerised methods, and how they can be minimised. Use your field of study as a base to answer.

32. Hunger without frontiers what does this mean to you? As an Engineer outline your views to alleviate hunger.

33. Describe the procedures to be followed in submitting and adjudicating on a claim.

34. Engineers are required by law to provide for disabled people in design and construction. Discuss the background and implications. Use your field of engineering to answer.

35. What are the likely problems arising from traffic in cities during the next decade? Can you suggest solutions?

36. Most industries require research and development (R&D) to improve end products and maximise profitability. What improvements would you recommend for R&D in an engineering industry?

37. Write down all the Procurement Structures and give account on each one of them.

38. Some years ago a national daily newspaper ran a science page once or twice a week until a readership survey showed few people read that particular page. Give reasons why you think the paper was or was not justified in dropping that regular science page and state what you would have done in the circumstances had you been the editor.

39. Some recent industrial accidents have highlighted the fact that in many fields important decisions affecting employee and public safety can still be authorised by underqualified and inexperienced personnel. Discuss the role which the Engineering Institutions could play in co-operation with government in redressing this situation so that proper control is exercised.

40. Industrialisation is the only hope of the poor health, food, education: nothing but the industrial revolution could have spread them right down to the very poor.
    a. How far do you think this statement was true in the past, and
    b. How valid do you think it is for the future.

41. “It is always a mistake and one that is seen too frequently, to identify roles by titles or function by the qualifications of the person in the role, or by grade, or by what the kind of work in the role appears to be”. Examine this statement and state your conclusions, drawing whenever possible, upon illustrates from an organisation in which you have worked.

42. The Government suggests as a national target a 15% energy saving within three years. Discuss ways in which this might be achieved in your own industry or field of engineering. To what extend do you consider that such measures would be beneficial to industry itself as well as to the national economy?

43. When do you consider a termination of a worker’s employment fair and unfair? Give remedies for unfair termination of employment.

44. What steps should an employer take to effect redundancy? What group of workers will the provisions on redundancy exempt?

45. What do you understand by compulsory arbitration and voluntary arbitration? What are the critical steps to be followed during arbitration?

46. Give the composition of the GhIE Council and duties of all the officers of the Institution. Write out a vision and mission statements that if followed will advance the course of engineering in Ghana.

47. What are the steps to take to ensure safety and health in industry?

48. You are to present a paper on “Developments in Technologies” during Annual General Conference of GhIE. Outline your thoughts and style of presentation (write up).

49. Eradication of “extreme poverty and hunger” this is the wish of every developing counter give suggestions for this to become reality.

50. Discuss the opportunities created by the trade liberalization policy on Industrial and Mining development in Ghana?

51. Many large industrial Projects nowadays are undertaken as joint ventures. Describe the advantages and disadvantages.

52. What role do you envisage Research and Development (R&D) would play in sustaining the competitiveness of an enterprise?

53. Define the role of the Engineer in helping to develop industries to address our seasonal agricultural problems of bumper harvests.

54. How would you maintain an enterprise in production through the proper management of stock inventory?

55. What safety measures would you put in place in your industry and why?

56. What quality standards do you have in your establishment and how does this help in accelerating the competitiveness of your industry?

57. Define the role of the Engineer in helping to develop industries to address our seasonal agricultural problems of bumper harvests.

58. How has the application of computers affected the engineering industry? Comment also on the attendant risks involved in adopting computerised methods, and how they can be minimised. Use your field of study as a base to answer.

59. How do you see your role as Engineer in the industrial development of Ghana?